

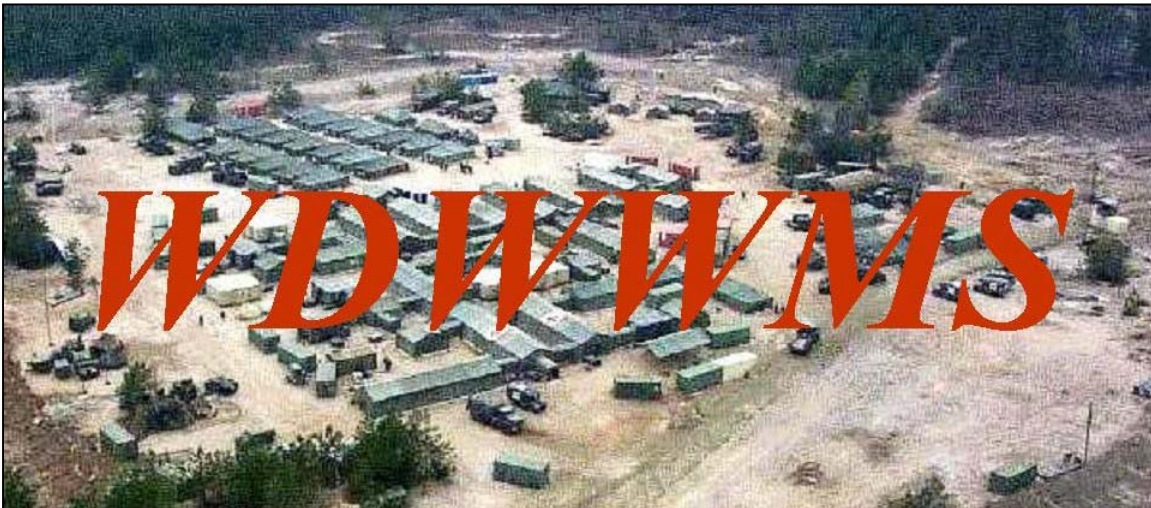
January 31, 2003

WATER DISTRIBUTION AND WASTE WATER MANAGEMENT SYSTEM (WDWWS) OPERATOR'S AND ORGANIZATION MAINTENANCE MANUAL

Configurations

**Medical Force 2000 (MF2K)
Medical Re-Engineering Initiative (MRI) – 84 Bed
Medical Re-Engineering Initiative (MRI) – 164 Bed**

Version 3



**U.S. Army Medical Materiel Agency
Fort Detrick, MD 21702-5001**

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Maryland 21702-5001

Water Distribution and Wastewater Management System (WDWWMS)

PREFACE

This manual provides the operator and maintainer instructions for the Water Distribution and Wastewater Management System. This system comes in three basic configurations:

- Medical Force 2000 (MF2K) – 296 Beds
- Medical Re-Engineering Initiative (MRI) – 84 Beds
- Medical Re-Engineering Initiative (MRI) – 164 Beds

It is designed to be used for the Combat Support Hospitals (CSH) in the Corps and Echelons above Corps areas.

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedure, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to: Commander, U.S. Army Medical Materiel Agency, ATTN: MCMR-MMT-E (WDSWWMS), 1423 Sultan Drive, Fort Detrick, Maryland 21702-5001. A reply will be furnished to you.

Water Distribution and Wastewater Management System (WDWWMS)

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Chapter 1

WATER DISTRIBUTION SET (WDS)

Introduction

1.1 General

a. This chapter describes the assembly, operation, and disassembly of the Water Distribution Sets (WDS). The combination of hoses, fittings, gauges, and valves provides maximum flexibility in setting up the sets. This flexibility will enable you to set up the sets in almost any configuration that will accommodate the hospital's mission.

b. The Water Distribution Sets come in four configurations depending on the type of Combat Support Hospital to which it is authorized.

- Water Distribution Set, Hospital, DEPMEDS (MF2K, 296 Bed)
- Water Distribution Set, MRI, 84 Bed (CORPS)
- Water Distribution Set, MRI, 164 Bed (CORPS)
- Water Distribution Set, MRI, 248 Bed (Echelons Above CORPS)

The components of these three configurations are identical; the only difference is the number or components authorized.

c. One of the main reasons for having a water distribution like this is to control infection and communicable diseases in the hospital. It is essential that the water be of the highest possible quality. Coordinate early for preventive medicine personnel to inspect, take samples from, and analyze the water distribution system. Advise hospital personnel that the water from the system cannot be considered potable until

certified by preventive medicine personnel.

1.2. Components

a. Cam-Lock Connections. With one exception, every connection in the water distribution system is cam-lock. That one exception is the field sink adapter, which is discussed later in this manual. Cam-lock is a quick connection system that requires no special training or tools. There are no threads. You simply insert the male end of the fitting into the female end of another fitting and pull the levers back to lock the two parts together. There are, however, precise steps in making and breaking this connection. These steps are discussed later in this manual.

b. Water Storage Tanks. Units will be authorized the following types and quantities of water tanks.

Types

- LIN T12938, Tank Fabric Collapsible, 20,000 Gallon Capacity
- LIN TBD, Tank Fabric, Collapsible, 5,000 Gallon
- LIN T19033, Tank, Fabric Collapsible, 3,000 Gallon Capacity

Requirements

	T12938	TBD	T19033
	20K Gal	5K Gal	3K Gal
MF2K	1	0	1
MRI 84	0	1	0
MRI 164	1	0	0

c. Water Pump. The water pump in this set (Pump Unit, Centrifugal, 65 GPM) has a 220 volt, 3 phase, totally enclosed, fan-cooled, electric motor. Each pump has a Class “L” connector (NSN 5935-01-086-6421, PN MS90556C32413P) capable of interfacing with the DEPMEDS electrical distribution system. Each pump has a male and female 1½-inch cam-lock fitting. There are two pumps in the water distribution set. One pump will serve the primary water distribution of the hospital, and the other is used a secondary, augmentation pump to maintain pressure through the secondary loops. For the MF2K configuration, a third pump is located in the Waste-Water Augmentation Set. This third pump will be used in the event that the Hospital Unit, Surgical (HUS) and the Hospital Unit, Base (HUB) operate independently.

CAUTION

Two persons are required to lift or carry a water pump.

d. Hoses. All hoses in the water distribution systems are tan in color. Each hose has a blue stripe running its length indicating use for potable water.

When sections of hose are connected, they are bulky and heavy. To avoid injury, limit the amount of hose carried to 60 feet. The set comes with hose reels that can be rolled. This is an effective way to move large amount of hose. **DO NOT DRAG THE HOSE.** You will damage it and the connections.

The hoses that are contained within the Water Distribution Set are:

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8338)
PN: 13225E9136-14
5 feet in length, 1 inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-175-5958)
PN: 13225E9136-12
10 feet in length, 1 inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-177-3714)
PN: 13225E9136-13
20 feet in length, 1 inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8337)
PN: 13225E9136-15
50 feet in length, 1 inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8336)
PN: 13225E9136-17
5 feet in length, 1½ inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-7779)
PN: 13225E9135-9
10 feet in length, 1½ inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8343)
PN: 13225E9136-9
10 feet in length, 1½ inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8341)
PN: 13225E9136-10
20 feet in length, 1½ inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8335)
PN: 13225E9136-18
50 feet in length, 1½ inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-140-6288)
PN: 13225E9136-4
20 feet in length, 4 inch diameter

e. Fitting and Valves. There are numerous fittings and valves in the water distribution system. With one exception, every fitting in the set has cam-lock connections.

(1) Valve, Gate, 2 inch female, 1½ inch male (NSN 4820-01-440-8306) (PN: 13229E7178). This valve is attached to either the female cam-lock of the Water Tank, Fabric Collapsible, 3,000 gallon or to the female cam-lock of the adapter for the Water Tank, Fabric Collapsible, 5,000 gallon or Water Tank, Fabric Collapsible, 20,000.

(2) Valve, Gate, 1½ inch female, 2-inch male (NSN 4820-01-440-8302) (PN: 13229E7177). This valve is attached to either the female cam-lock of the Water Tank, Fabric Collapsible, 3,000 gallon or to the female cam-lock of the adapter for the Water Tank, Fabric Collapsible, 5,000 or Water Tank, Fabric Collapsible, 20,000 gallon

(3) Valve, Globe, 1½ inch female, 1½ inch male. (NSN: 4820-01-440-8765) (PN: 13229E7169). This valve is attached to the 1½ inch loop, immediately after the beginning of a 1-inch loop. It is also used when multiple water tanks are arranged in parallel. In this application, this valve controls the rate of flow in the system.

(4) Valve, Gate, 1-inch female, 1-inch male (NSN 4820-01-440-7798) (PN: 13229E7167). When used with individual water users, such as field sinks and nozzles, these valve controls

the rate of flow. It is also used at the beginning of secondary loops and long one-way water lines. Used this way, repairs or changes in the secondary loops can be made without interrupting water supply to the rest of the hospital.

(6) Valve, Check, 2-inch male, 1½ inch female. This is used on the side of the water tank to prevent back-flow of water into the system.

(7) Tee Assembly, Quick Disconnect, 1½ inch female, 1½ inch male, 1 inch male. (NSN: 4730-01-440-4609) (PN: 13229E7172) This fitting is used at each place where the one-way feeder lines branch off to the individual users, such as CMS, pharmacy, X-Ray, laboratory. It is also used at the beginning and end of the secondary loop.

(8) Tee Assembly, Quick Disconnect, 1-inch female, 1-inch male, 1 inch male. (NSN: 4730-01-440-4091) (PN: 13229E0361) This fitting allows connection of the individual users along secondary loops or long one-way lines.

(9) Tee Assembly, Quick Disconnect, 1½ inch female, 1½ inch male, 1½ inch male. (NSN: 4730-01-440-4633) (PN: 13229E7182) This fitting is used on the return side of the primary loop.

(10) Tee Assembly, Quick Disconnect, 1½ inch female, 1½ inch female, 1½ inch male. (NSN: 4730-01-440-4615) (PN: 13229E7181). This fitting is located between the water storage tanks and the pump when the water storage tanks are employed in parallel.

Water Distribution and Wastewater Management System (WDWWMS)

(11) Tee Assembly, Quick Disconnect, 1-inch female, 1-inch male, 1-inch male. (NSN: 4730-01-440-4613) (PN: 13229E7174)

(12) Tee Assembly, Quick Disconnect, 1½ inch female, 1-inch female, 1½ inch male. (NSN: 4730-01-440-4931) (PN: 13230E5716).

(13) Tee Assembly, Quick Disconnect, 1-inch male, 1½ inch male, 1½ inch female (NSN: 4730-01-440-4933) (PN: 13230E5717).

(14) Tee Assembly, Reducing, 1 inch male, 1½ inch female, 1½ inch male. (NSN: 4730-01-440-4938) (PN: 13230E5715).

(15) Tee Assembly, Quick Disconnect, 1½ inch female, 1½ inch male, ¼ inch male (NSN: 4730-01-487-3575). This fitting is used to connect the Hypochlorination Unit (NSN: 4610-01-435-4884) (PN: WAL-1031-96) to the primary water loop.

(16) Coupling Assembly, Quick Disconnect, 1-inch female, 1-inch female. (NSN: 4730-01-440-8569) (PN: 13229E7173). This is used either to connect two male ends of the hose loops or to connect the water lines to the Hamilton Sinks in the ISO containers.

(17) Plug, Quick Disconnect. (NSN 4730-01-415-6403) (PN: 13229E7170), sink adapter for the field sinks.

(18) Adapter, Straight Hose. (NSN: 4730-01-415-6420) (PN: 13229E7195), used with the Plug, Quick Disconnect.

(NSN 4730-01-415-6403) (PN: 13229E7170) to allow the connection of the adapter to the hose threads on the sink.

(19) Reducer, Quick Disconnect, 4-inch female, 2-inch male (NSN: 4730-01-064-0560) (PN: AA59326XI-1-9). This fitting is used on the supply side of the Water Tank, Fabric Collapsible, 5,000 gallon or Water Tank, Fabric Collapsible, 20,000.

(20) Reducer, Quick Disconnect, 2-inch female, 4-inch male (NSN: 4730-01-186-0821) (PN: AA59326XI-1-10). This fitting is used on the return side of the Water Tank, Fabric Collapsible, 5,000 gallon or Water Tank, Fabric Collapsible, 20,000.

(21) Adapter Assembly, Quick Disconnect, 4-inch female, 1½ inch male (NSN 4730-01-445-5188) (PN: 13229E7190).

(22) Reducer, Quick Disconnect, 1-inch female, 1½ inch male (NSN: 4730-01-499-8752) (PN: 3629). This fitting is used with the Heater, Water, 9,000 Watts (NSN: 4520-01-493-7423) (PN: 111739) for connect of the heater to the secondary water loop.

(23) Reducer, Quick Disconnect, 1½ inch female, 1-inch male (NSN: 4730-01-499-8687) (PN: 3630) for connect of the heater to the secondary water loop.

f. Other Components:

(1) Pipe Assembly, Potable Water (NSN: 4610-01-440-4086) (PN: 13229E7162). This vital component measures the water pressure in the

distribution system. This gauge is placed at the end of the main loop. Its precise location depends on how the tanks are employed. **THE PRESSURE GAUGE IS FRAGILE.** When not in use, store it in the storage containers.

(2) Pipe Assembly, Potable Water. (NSN: 4610-01-440-4088) (PN: 13229E7165). The water distribution system uses a flow meter that measures flow rates up to 100 GPM. It is placed at the end of the primary loop, immediately before the pressure gauge. **FLOW METERS ARE FRAGILE.** When not in use store them in the storage container.

(3) Case, Electrical-Electronic Test. (NSN: 6625-01-449-2857) (PN: 13229E7189). This case is used to store the pressure gauges and flow meters.

(4) Indicator Assembly. (NSN: 4610-01-440-6834) (PN: 13229E7163) This is an indicator assembly, sight liquid, to monitor water flow through the distribution system.

(5) Stand Assembly, Distribution Nozzle. (NSN 4930-01-120-7426) (PN: 13225E9140). This tripod style assembly is used to suspend the Nozzle Assembly, Water (NSN: 4610-01-440-6834).

(6) Nozzle Assembly, Water. (NSN: 4610-01-440-6834) (PN: 13229E7168) is provided to supply water to those parts of the hospital that is not connected to the water distribution system. Other used for this nozzle are outlined in the principles of installation section of this chapter.

(7) Strainer, Sediment. (NSN: 4730-01-440-7662) (PN: 13229E7180) This fitting is used to drain sediment in the distribution system.

(8) Pump Unit, Centrifugal (NSN: 4320-01-440-4421) (PN: 13229E7159) Two pumps are supplied with the water distribution system. These pumps come with quick-disconnect fittings, and are capable of producing a 65 GPM water flow through the system.

(9) Hypochlorination Unit, Water Purification. (NSN: 4610-01-435-4884) (PN: WAL 1031-96) This item of equipment is designed to chlorinate the water within the water distribution system to help prevent bacterial and fungal growth within the hoses of the system. It is also designed to provide the capability to flush the water lines with chlorine.

(10) Heater, Water, 9,000 Watts. (NSN: 4520-01-493-7423) (PN: 111739). This item of equipment is designed to raise the ambient temperature of the water in the potable water distribution lines to above freezing.

(11) Cage, Wire, Folding. This cage is used for the storage of hoses and fittings used in the distribution set.

1.3. Principles of Installation

The water distribution system is intended to be as flexible in its layout as the DEPMEDS hospital itself. **THERE IS NO ONE CORRECT WAY TO SET UP THE WATER DISTRIBUTION SYSTEM.** The number of possible configurations is

almost unlimited. The information within the paragraph provides the basic guidelines necessary in planning the layout of the system for your hospital. Like other systems, the layout must be planned in advance. Obtain a copy of the hospital layout plan as soon as possible.

a. Location of the Water Storage Tank(s). Siting the water storage tank(s) is the most important decision in setting up the water distribution system. There are a number of factors to consider:

(1) *Traffic Flow*. Trucks delivering water need access to the water storage tank(s).

(2) *Electric power*. The pump, water heater, and hypochlorination unit will sit next to the water tank(s), and the pump needs electric power. The electric cable on the pump, and water heater is 40 feet long.

(3) *Near the Primary Loop*. The water distribution system was designed for the primary loop to be near the highest concentration of ISO's.

(4) *Sufficient Area*. The water distribution system comes with one of several water tanks, dependent upon configuration:

Capacity	Length (ft)	Width (ft)
3,000	13.8	13.8
5,000	16.3	16.3
20,000	27.2	27.2

b. Location of the Primary Loop. The ISO's make up the largest number of water users in the hospital.

They also use a large amount of water. For these reasons, the primary loop should make its circuit around the highest concentration of ISO's. This approach also has the advantage of reducing the length of the primary loop, as well as reducing the amount of hose needed to connect the ISO's. The number of hospital components being used and their configuration dictates the length of the primary loop.

c. Secondary Loop(s).

Secondary loops are normally installed instead of long one-way water lines. Water constantly moves in secondary loops. This greatly reduces the amount of stagnant water and the potential of bacterial growth. Flowing water stays cooler longer in the summer, and resists freezing in the winter.

d. Water Distribution Nozzles.

Water distribution nozzles have several applications in the DEPMEDS hospital.

(1) An important application of the nozzle is to supply water to those parts of the hospital that are not connected to the water distribution system.

(2) The nozzle is an efficient way of filling the autoclaves. Place a nozzle with tripod near the CMS TEMPER. The hand valve on the nozzle is not very sensitive. For this reason, install a 1-inch female-male gate valve (PN: 13229E7167) in the line leading to the nozzle. Use the gate valve to adjust the flow to the nozzle, or else you will have everywhere except in the autoclave. Locate the valve 20 feet or so away from the nozzle to enable you to move it without also moving the valve.

e. Crossing Pedestrian and Vehicle Routes. Hoses should not cross vehicle routes. Hoses crossing pedestrian paths should be kept to a minimum. If a hose must cross a TEMPER, do so at a corridor, and use a hose protection channel.

1.4. Assembly

a. This paragraph provides some general guidelines and a few hard rules on how to assembly the system. You should be able to determine the layout of the water distribution system based on the information in the previous paragraphs.

b. Assembly the water storage tank(s). Locate them using the information in paragraph 3a.

(1) 20,000 Gallon tank fittings installation.

(a) Supply Fittings

- Elbow 4" F x 4" M (is packed with the water tank)
- Hose assembly, nonmetallic 4" x 20' (NSN 4720-01-140-6288, PN 13225E9136-4)
- Reducer, Quick Disconnect, 4" F x 2" M (NSN 4730-01-064-0560 PN AA59326XI-1-9)
- Valve, Gate, 2" F x 1 1/2" M (NSN 4820-01-440-8306, PN 13229E7178)

(b) Return Fittings

- Elbow, 4" M x 4" F (packed with water tank)
- Hose assembly, nonmetallic 4" x 20' (NSN 4720-01-140-6288, PN 13225E9136-4)

- Reducer, Quick Disconnect, 2" F X 4" M (NSN 4730-01-186-0821, PN AA59326XI-1-10)

- Valve, Gate, 1 1/2" F x 2" M (NSN 4820-01-440-8302, PN 13229E7177)

(2) 5,000 Gallon tank fittings installation:

(a) Supply fitting:

- Valve, Gate (NSN 4820-01-440-8306, PN 13229E7178)

(b) Return fitting:

- Valve, Gate (NSN 4820-01-440-8302, PN 13229E7177)

(3) 3,000 Gallon tank fittings installation

(a) Supply fitting:

- Valve, Gate (NSN 4820-01-440-8306, PN 13229E7178)

(c) Return fitting:

- Valve, Gate (NSN 4820-01-440-8302, PN 13229E7177)

c. Attach the filter.

d. Connect the hose between the pump and the water tank.

e. Select an open sockets on an electrical distribution panel. Make sure the circuit is off. Plug the pump's and water heater's electrical plugs into the electrical sockets.

f. Lay the primary loop, following

the guidance in proceeding paragraphs.

DO NOT CONNECT THE HOSES YET. DO NOT REMOVE THE CAPS OR PLUGS.

Be aware of the requirements for fittings near the ISO walls that have water receptacles. Connections between hoses in the primary loop should occur near these points. Also be aware of other requirements for breaks in the loop, such as secondary loops, feeder lines to individual users, and nozzles to the CMS.

g. Lay the 1-inch hose for the feeder lines between the main loop and the ISO's. This process more clearly defines the need for breaks in the primary loop and for fittings.

(1) The CMS ISO has two water receptacles. All other ISO's have one water receptacle (except OR, which has none). Figure 1-1 shows the connection between the main loop and the CMS ISO. The Hose (item D) is optional; you can omit it, or use any length (other than 50 foot) needed. Place the gate valve next to the tee (item f). Placing the valve here enables you to disconnect an

individual ISO without disrupting water supply to the rest of the hospital.

(2) Figures 1-2 and 1-3 show two different methods to make the connection between the main loop and an ISO with one water receptacle. The hose (item b, figure 1-3) is optional; you can omit it or put any length you need. Figure 1-3 shows the same configuration with the hose omitted. Do not omit the gate valve (item b, figure 1-3). It allows you to disconnect an individual ISO without disrupting the water supply to the rest of the hospital.

h. Lay the fittings and hose for the secondary loop(s). The beginning of each secondary loop is configured like that shown in Figure 1-4. The 1-inch gate valve here (item c) and at the end of the loop (item b, figure 1-5) allow you to shut off the water supply to the secondary loop without disrupting the water supply to the rest of the system. Always leave this valve open unless you are working on the secondary loop. To force water into the secondary loop, gradually close the 1 ½ inch valve (item e) until the flow meter (item b) shows the flow between 5 and 10.

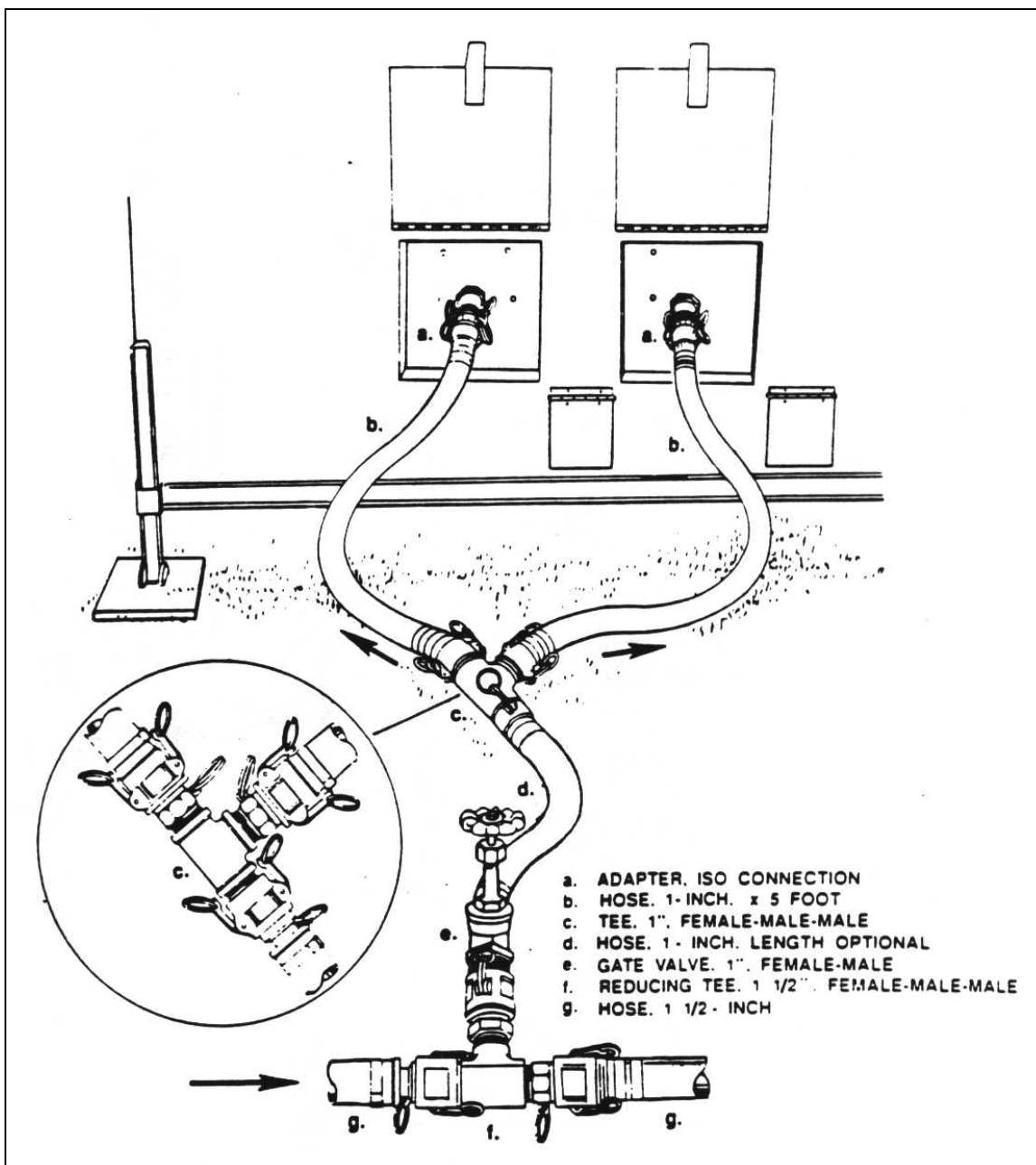


Figure 1-1
Water Hose Connection to the CMS ISO

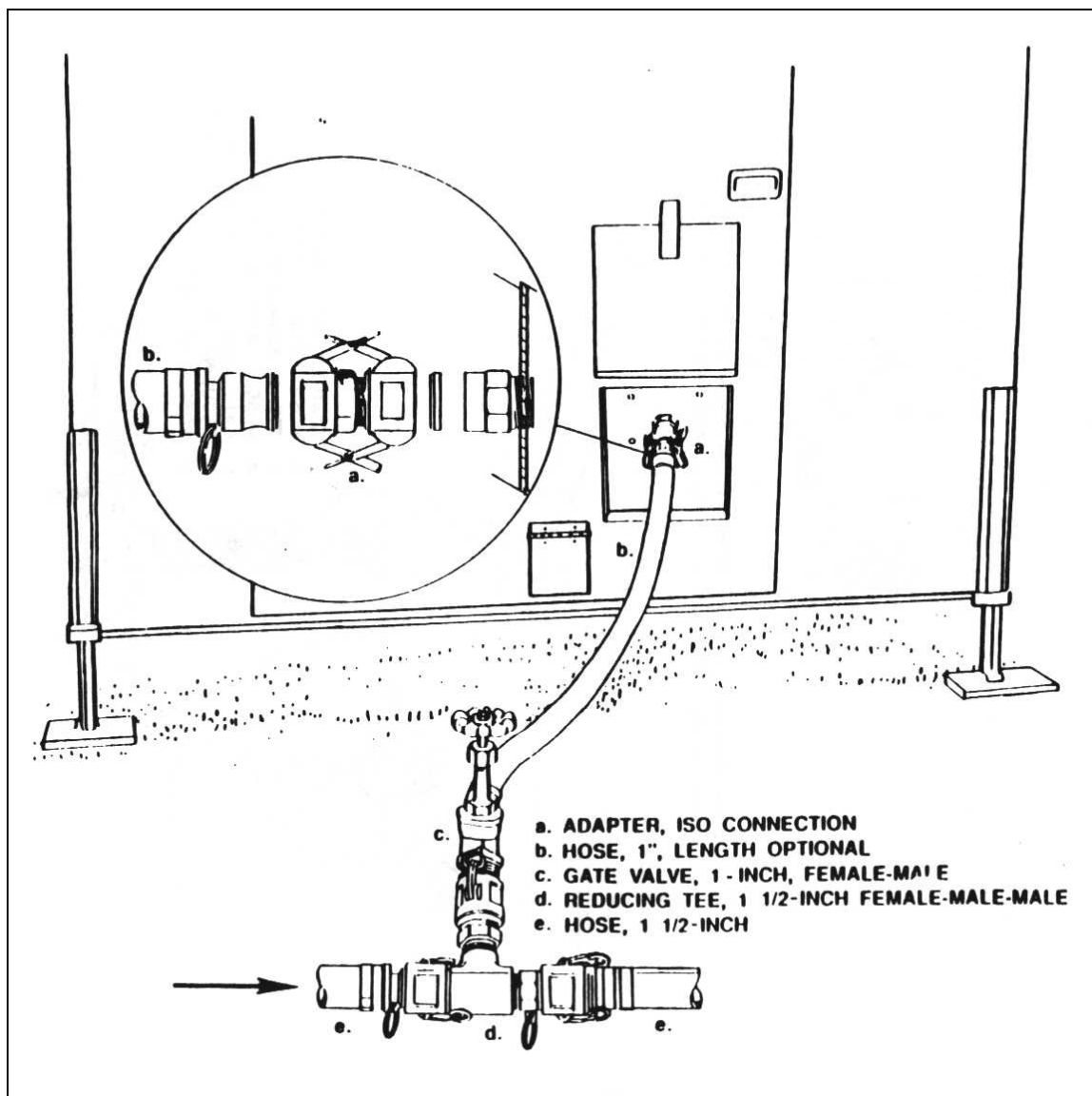


Figure 1-2
Connection to a Single Receptacle ISO (with hose)

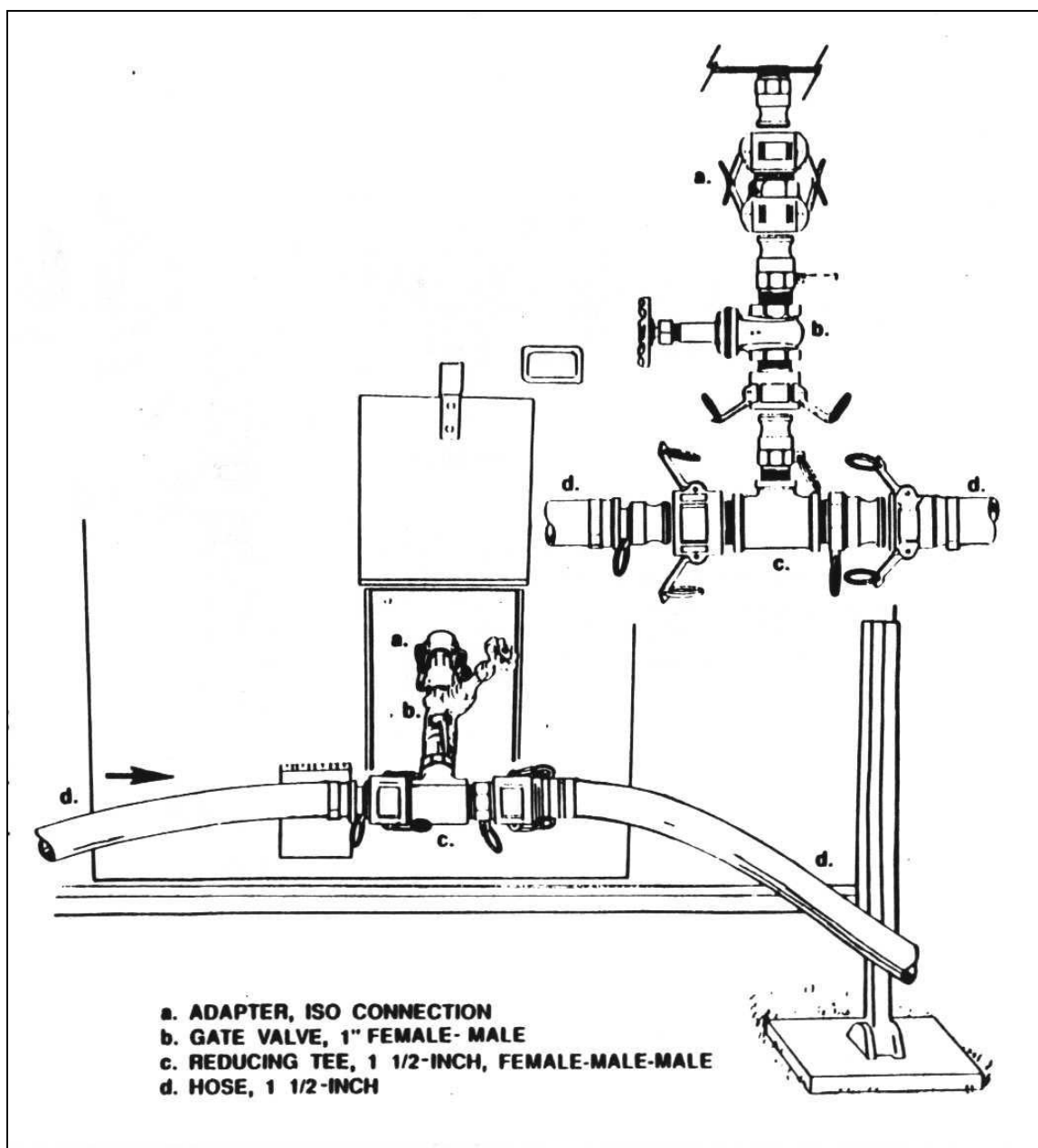


Figure 1-3
Connection to a Single Receptacle ISO (without hose)

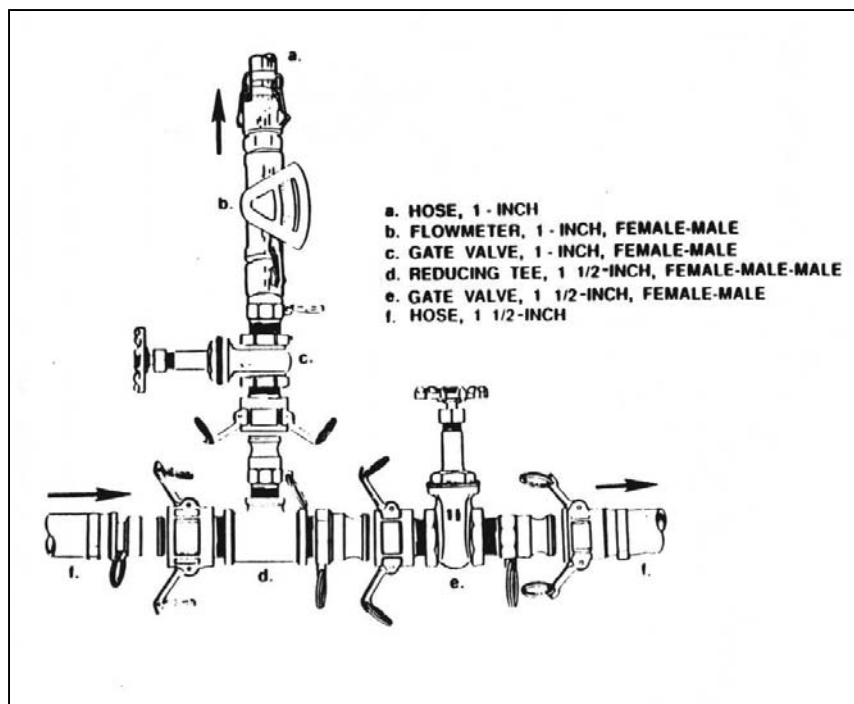


Figure 1-4
Fittings at the Start of a 1-Inch Loop

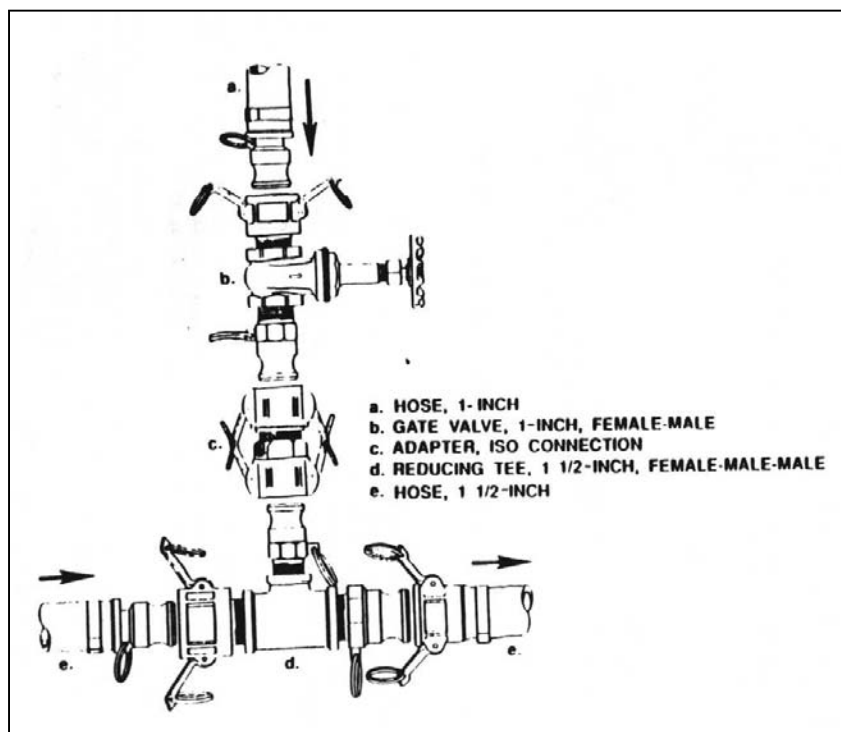


Figure 1-5
Fittings on Return Side of a 1-Inch Loop

i. The return side of each secondary loop is configured like that shown in Figure 1-5. The gate valve (item b) is used with the 1-inch valve discussed in paragraph h, above. The female-female adapter (item c) is used to connect the male fitting on the secondary loop to the one on the reducing tee (item d) in the primary loop.

j. Lay the necessary fittings and hose to connect the field sinks. Figure 1-6 is a typical configuration. The hose (item d) is optional. You can omit it, or use any length hose you need. There are two possible connections to the field sink:

- Option 1 shows the connection from a 1-inch hose line.
- Option 2 shows the connection from a 1½ - inch loop.

k. Lay hose lines to the nozzle locations. Place one nozzle next to each CMS tent. These hose lines need enough slack so that the nozzle can reach each autoclave. Place the 1- inch gate valve far enough away from the nozzle so that when the nozzle and hose are moved, the gate valve is not dragged.

l. Use the hose protection channels for hose crossing TEMPER corridors. If conditions and time permit, you may bury the hose and the protective channel, but it is not necessary. Run the hose under the edge of the tent flap and both layers of floor. You may have to untie the floor tie-downs. Place the protection channel along the width of the corridor. **DO NOT PLACE A PROTECTION CHANNEL OVER A HOSE CONNECTION.**

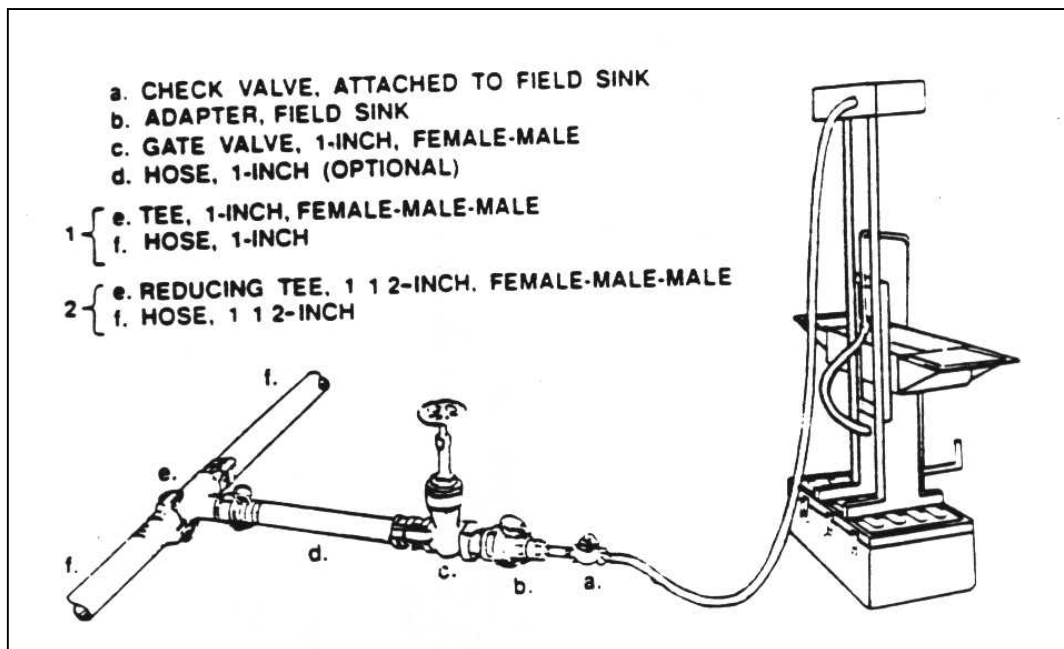


Figure 1-6
Field Sink Connections

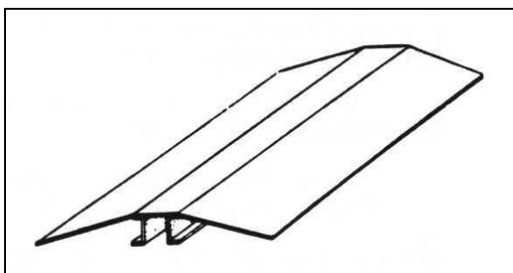


Figure 1-7
Channel, Hose Protector, Surface
(NSN 4720-01-440-4925)
(PN 13229E7176)

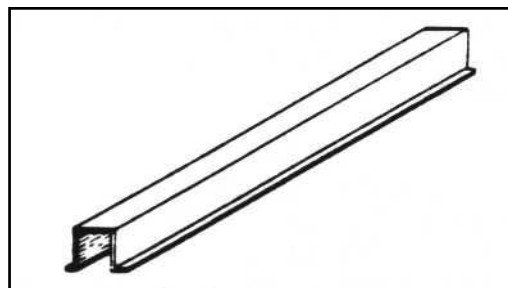


Figure 1-8
Channel, Hose Protector, Subsurface
(NSN 4720-01-440-4928)
(PN 13229E7175)

Chapter 2

WATER DISTRIBUTION SET (WDS)

Medical Force 2000 (MF2K) 296 Bed Configuration

Medical Re-Engineering Initiative (MRI) 248 Bed Configuration

Operator, PMCS, and Repair Instructions

2-1. Introduction

a. This chapter describes the assembly, operation, and disassembly of the Water Distribution Set (WDS) (MF2K Configuration); MRI 248 Bed Configuration).

b. The main reason for having a pressurized water distribution system is to control infection and communicable diseases in the hospital. The WDS accomplishes this by starting with covered water storage tanks, pressurizes the water with electric pumps, adds chlorine as necessary, and routes the potable water through a distribution system to designated areas of the hospital.

c. It is necessary that you coordinate early with Preventive Medicine personnel to inspect, take samples from, and analyze the water distribution system. Advise hospital personnel that the water from the system cannot be considered potable until certified by Preventive Medicine personnel.

2-2. Components.

a. *Cam-Lock Connections.* With two exceptions every connection in the water distribution system is connected to similar hoses by use of cam-lock fittings. The exception connects are the field sink adapter and the ISO adapter. Both connections are discussed later in this chapter. Cam-lock is a quick

disconnection system that requires no special training or tools. There are no threads on the parts or hoses to be connected. To use cam-lock fittings, the dust cap or plug is removed from each hose end, then insert the male end fitting into the female end of the other fitting. Pull the levers back towards the hose to cam-lock the two parts together. There are some steps to be followed in making and breaking a hose connection. These steps are discussed later in this manual.

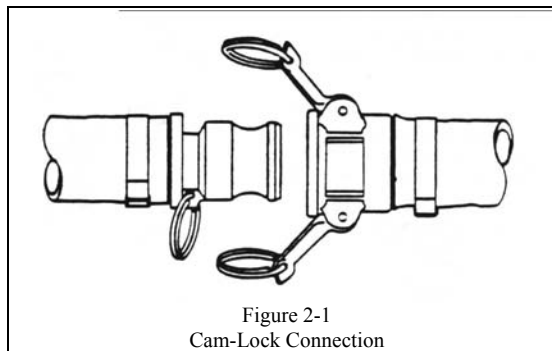


Figure 2-1
Cam-Lock Connection

Water Storage Tanks. Units are authorized the following types and quantities of water storage tanks.

Types

- LIN T12938 – Tank Fabric, Collapsible, 20,000 Gallon Capacity (NSN 5430-01-406-0507)

Water Distribution and Wastewater Management System (WDWWMS)



Figure 2-2
Tank Fabric Collapsible, 20,000 Gallon
Laid Out on Ground

- LIN T19033 – Tank, Fabric, Collapsible, 3,000 Gallon Capacity (NSN 5430-01-170-6984) This tank is packed in the Waste-Water Augmentation Set, Hospital, DEPMEDS (WWAS) (LIN: W49603) (NSN: 6545-01-435-6013) and is designed for use with the Medical Force 2000 (MF2K) configured Combat Support Hospital (CSH) 296 Bed for use in split-based operations.

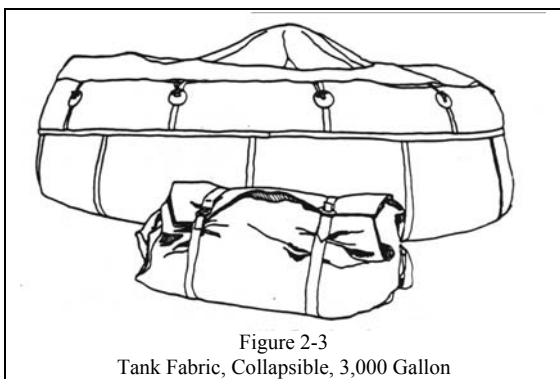


Figure 2-3
Tank Fabric, Collapsible, 3,000 Gallon

Requirements

	T12938	T19033
MF2K CSH	1	1
MRI CSH 164	1	0

b. *Water Pump.* The water pump used in the WDS (Pump Unit, Centrifugal, 65 GPM [NSN 4320-01-440-4421]) has a 220 volt, 3-phase, totally enclosed, fan-cooled, electric motor. Each water pump is supplied with an integral power cord (40') that terminates in a male Class "L" power

connector. The plug interfaces directly with the DEPMEDS electrical distribution system. Each pump is outfitted with a male and female, 1 1/2-inch cam-lock connection. There are two pumps in the WDS. One pump will serve the primary water distribution loop of the hospital, and the other is used to augment or maintain pressure through the secondary loops. For the MF2K configuration, a third pump is located in the Waste-Water Augmentation Set, Hospital, DEPMEDS (WWAS) (LIN: W49603) (NSN: 6545-01-435-6013). The third pump will be used in the event that a Hospital Unit Base (HUB) and a Hospital Unit Surgical (HUS) operate independently.

CAUTION

Two persons are required to lift or carry a water pump.

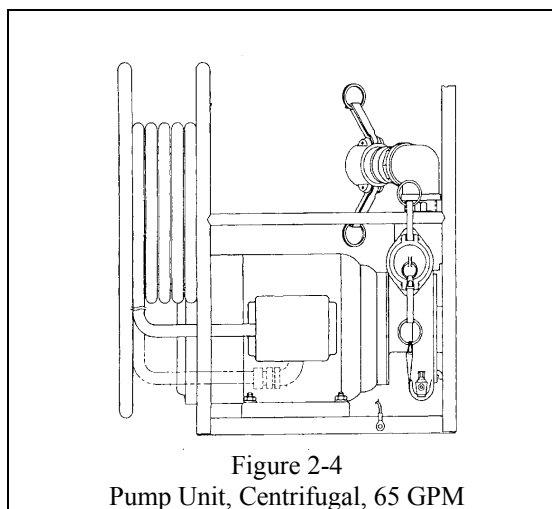


Figure 2-4
Pump Unit, Centrifugal, 65 GPM

c. *Hoses.* The hoses that are contained within the WDS are:

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8338)
PN: 13225E9136-14
5 feet in length, 1 inch diameter

Water Distribution and Wastewater Management System (WDWWMS)

Hose Assembly, Nonmetallic
(NSN: 4720-01-175-5958)
PN: 13225E9136-12
10 feet in length, 1 inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-177-3714)
PN: 13225E9136-13
20 feet in length, 1 inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8337)
PN: 13225E9136-15
50 feet in length, 1 inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8336)
PN: 13225E9136-17
5 feet in length, 1½ inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-7779)
PN: 13225E9135-9
10 feet in length, 1½ inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8343)
PN: 13225E9136-9
10 feet in length, 1½ inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8341)
PN: 13225E9136-10
20 feet in length, 1½ inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8335)
PN: 13225E9136-18
50 feet in length, 1½ inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-140-6288)
PN: 13225E9136-4
20 feet in length, 4-inch diameter

d. *Fittings and Valves.* There are

numerous fittings and valves within the WDS. With two exceptions every fitting in the set has cam-lock connections.

(1) Reducer, 4-inch female, 2-inch male (NSN: 4730-01-064-0560) (PN: AA59326XI-1-9). This reducer is used on the supply side of the Tank, Fabric, Collapsible 20,000-Gallon.
NOTE: Some valves and fitting descriptions are identified with the letter F for female and M for male connections.

(2) Reducer, 4-inch male, 2-inch female (NSN: 4730-01-186-0821) (PN: AA59326XI-1-10). This reducer is used on the return side of the Tank, Fabric, Collapsible 20,000-Gallon.

(3) Valve, Gate, 2-inch female, 1½ inch male (NSN 4820-01-440-8306) (PN: 13229E7178). This valve is attached to the male cam-lock of the Reducer, 4" F x 2" M (NSN: 4730-01-064-0560, PN: AA59326XI-1-9) which will be used on the Tank Assembly, Fabric Collapsible (20,000 gallon) (LIN: T12938, NSN: 5430-01-406-0507).

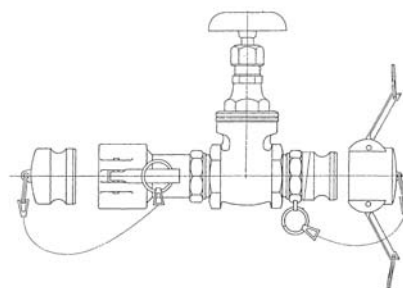


Figure 2-5
Valve, Gate, 1½ inch female, 2 inch male

(4) Valve, Gate, 1½ inch female, 2-inch male (NSN: 4820-01-440-8302, PN: 13229E7177). This valve is attached to the female cam-lock of the Reducer, 4" M, 2" F (NSN: 4730-01-

Water Distribution and Wastewater Management System (WDWMS)

186-0821) (PN: AA59326XI-1-10) which will be used on the Tank Assembly, Fabric Collapsible (20,000 gallon) (LIN: T12938, NSN: 5430-01-406-0507).

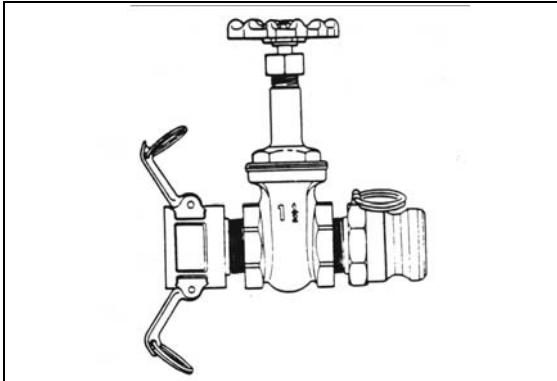


Figure 2-6
Valve, Gate, 1½ inch female, 2 inch male

(5) Valve, Globe, 1½ inch female, 1½ inch male (NSN: 4820-01-440-8765, PN: 13229E7169). This valve is attached to the 1½ inch loop, immediately after the beginning of a 1-inch loop. It is also used when multiple water tanks are arranged in parallel. In this application, the valve is manually adjusted to control the rate of flow in the system.

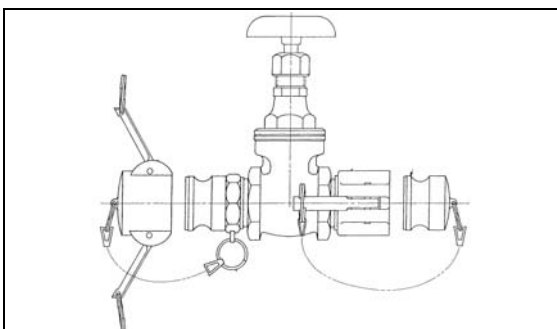


Figure 2-7
Valve, Globe, 1½ inch female, 1½ inch male

(6) Valve, Gate, 1 inch female, 1 inch male (NSN: 4820-01-440-7798, PN: 13229E7167). When used with individual water users, such as field

sinks and nozzles, this valve controls the rate of flow. It is also used at the beginning of secondary loops and long one-way water lines. Used this way, repairs or changes in the secondary loops can be made without interrupting water supply to the rest of the hospital.

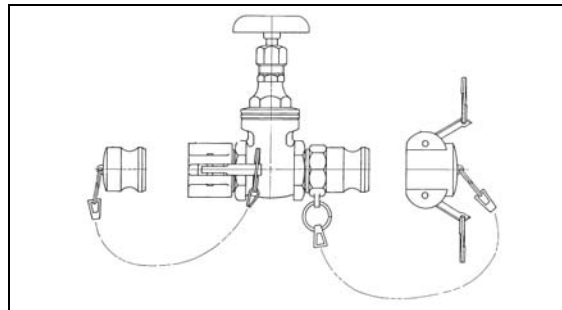


Figure 2-8
Valve, Gate, 1 inch female, 1 inch male

(7) Tee Assembly, Quick Disconnect, 1½ inch female x 1½ inch male (NSN: 4730-01-440-4609, PN: 13229E7172). This fitting is used at each place where the one-way feeder lines branch off to the individual users, such as CMS, pharmacy, X-Ray, laboratory, etc. It is also used at the beginning and end of the secondary loop.

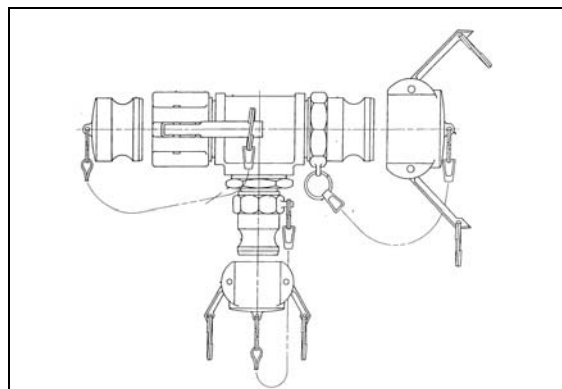


Figure 2-9
Tee Assembly, Quick Disconnect, 1½ inch female x 1½ inch male x 1 inch male

Water Distribution and Wastewater Management System (WDWWMS)

(8) Tee Assembly, Quick Disconnect, 1 inch female, 1 inch male, 1 inch male (NSN: 4730-01-440-4091, PN: 13229E0361). This fitting allows connection of the individual users along secondary loops or long one-way lines.

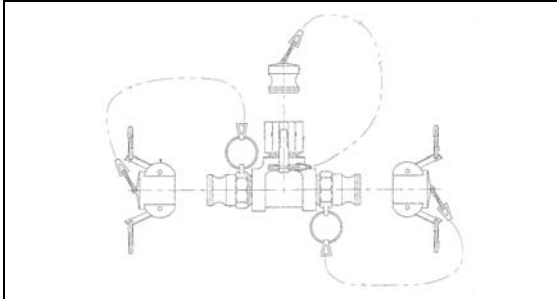


Figure 2-10
Tee Assembly, Quick Disconnect, 1 inch female,
1 inch male, 1 inch male

(9) Tee Assembly, Quick Disconnect, 1½ inch male, 1½ inch male, 1½ inch female (NSN: 4730-01-440-4633, PN: 13229E7182)(see figure A-10). This fitting is used on the return side of the primary loop.

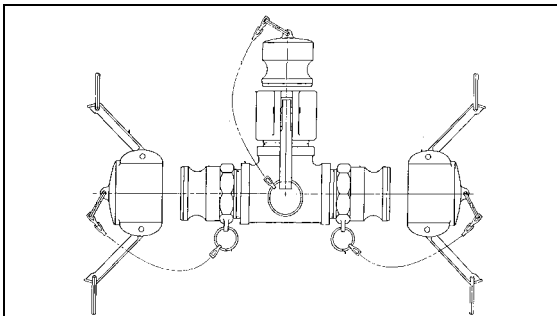


Figure 2-11
Tee Assembly, Quick Disconnect, 1½ inch male,
1½ inch male, 1½ inch female

(10) Tee Assembly, Quick Disconnect, 1½ inch female, 1½ inch female, 1½ inch male (NSN: 4730-01-440-4615, PN: 13229E7181). This fitting is located between the Tank Assembly, Fabric Collapsible (3,000 Gallon) (LIN: T19033, NSN: 5430-01-170-6984) and the Pump Unit,

Centrifugal, 65 GPM [NSN 4320-01-440-4421] when two or more Tank Assembly, Fabric Collapsible (3,000 Gallon) are employed in parallel.

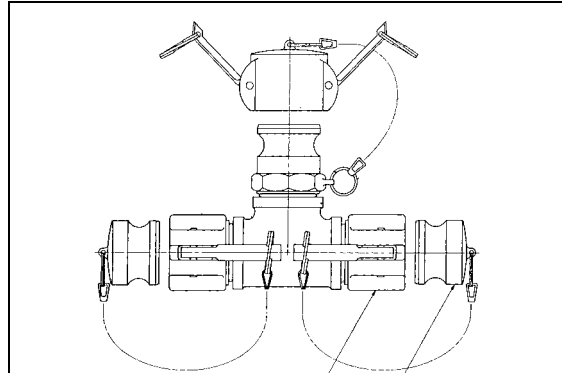


Figure 2-12
Tee Assembly, Quick Disconnect, 1½ inch
female, 1½ inch female, 1½ inch male

(11) Tee Assembly, Quick Disconnect, 1½ inch female x 1½ inch male x 1 inch male (NSN: 4730-01-440-4613, PN: 13229E7174).

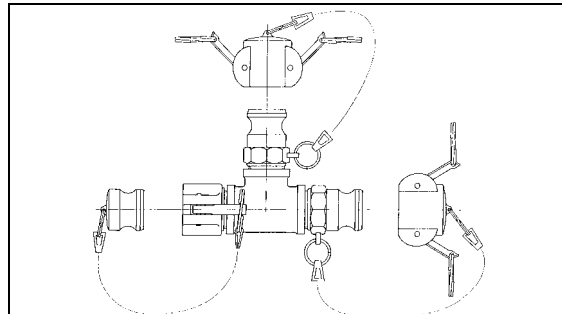


Figure 2-13
Tee Assembly, Quick Disconnect, 1½ inch
female x 1½ inch male x 1-inch male

(12) Tee Assembly, Quick Disconnect, 1½ inch male x 1 inch female x 1½ inch female (NSN: 4730-01-440-4931, PN: 13230E5716).

Water Distribution and Wastewater Management System (WDWWMS)

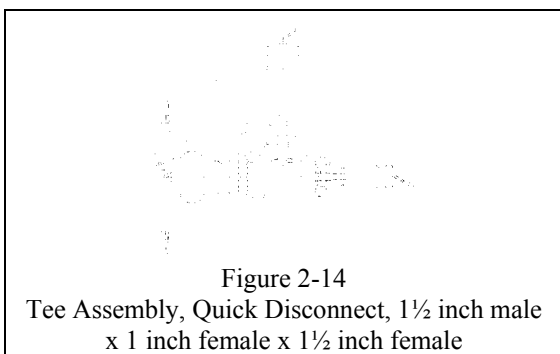


Figure 2-14

Tee Assembly, Quick Disconnect, 1 1/2 inch male x 1 inch female x 1 1/2 inch female

(13) Tee Assembly, Quick Disconnect, 1 inch male x 1 1/2 inch male x 1 1/2 inch female (NSN: 4730-01-440-4933, PN: 13230E5717).

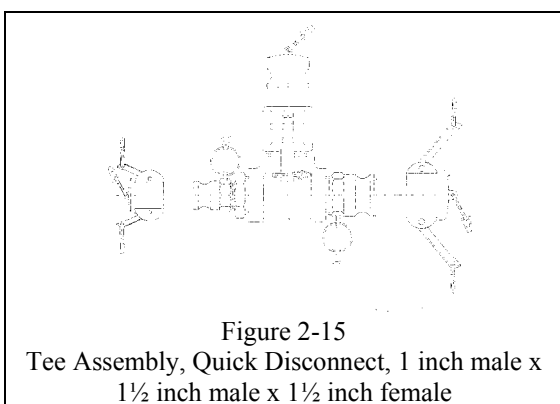


Figure 2-15

Tee Assembly, Quick Disconnect, 1 inch male x 1 1/2 inch male x 1 1/2 inch female

(14) Tee Assembly, Quick Disconnect, 1 inch male x 1 1/2 inch female x 1 1/2 inch male (NSN: 4730-01-440-4938, PN: 13230E5715).

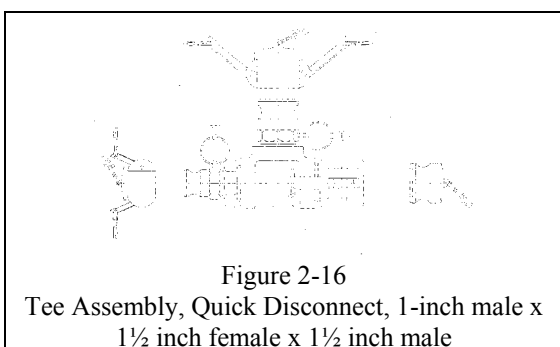


Figure 2-16

Tee Assembly, Quick Disconnect, 1-inch male x 1 1/2 inch female x 1 1/2 inch male

(15) Tee Assembly, Quick Disconnect, 1 1/2 inch female, 1 1/2 inch male x 1/4 inch male (NSN: 4730-01-487-3575) is used to connect the

Hypochlorination Unit (NSN: 4610-01-435-4884) (PN: WAL-1031-96) to the primary loop.

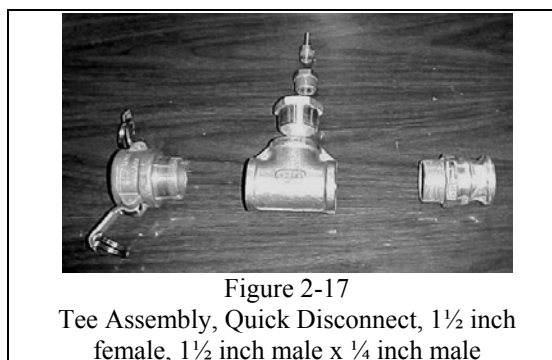


Figure 2-17

Tee Assembly, Quick Disconnect, 1 1/2 inch female, 1 1/2 inch male x 1/4 inch male

(16) Coupling Assembly, Quick Disconnect, 1 inch female x 1 inch female (NSN: 4730-01-440-8569, PN: 13229E7173). This coupler is commonly referred to as a “Gender Changer”. It is used when a male outlet is connected to a second male connection and as a connection on the Hamilton Sink connections for the ISO containers.

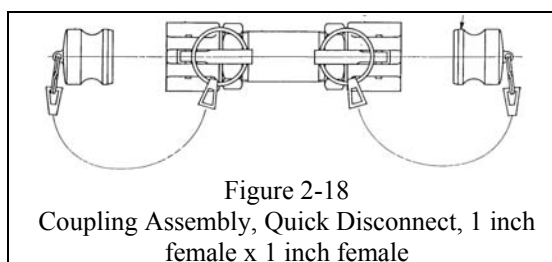


Figure 2-18

Coupling Assembly, Quick Disconnect, 1 inch female x 1 inch female

(17) Plug, Quick Disconnect (NSN: 4730-01-415-6403, PN: 13229E7170). This fitting is used in conjunction with Adapter, Straight Hose to Boss (NSN: 4730-01-415-6420, PN: 13229E7195) to connect field sinks to the water loop.

Water Distribution and Wastewater Management System (WDWMS)

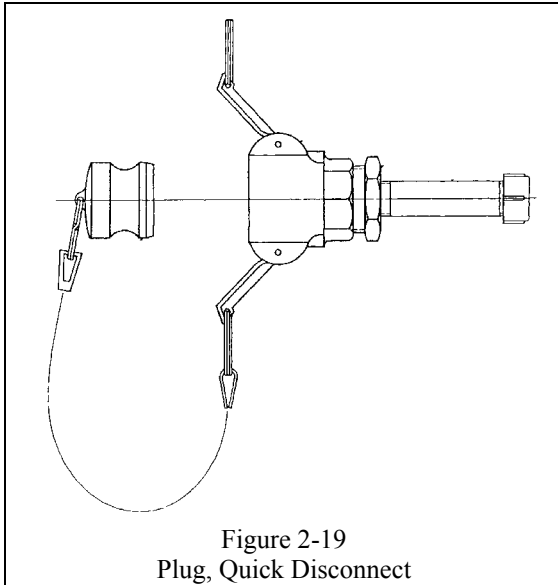


Figure 2-19
Plug, Quick Disconnect

(18) Adapter, Straight Hose to Boss (NSN: 4730-01-415-6420, PN: 13229E7195). This fitting is used in conjunction with Plug, Quick Disconnect (NSN: 4730-01-415-6403, PN: 13229E7170) to connect field sinks to the water loop. This is the first example where both connections are not cam-lock.

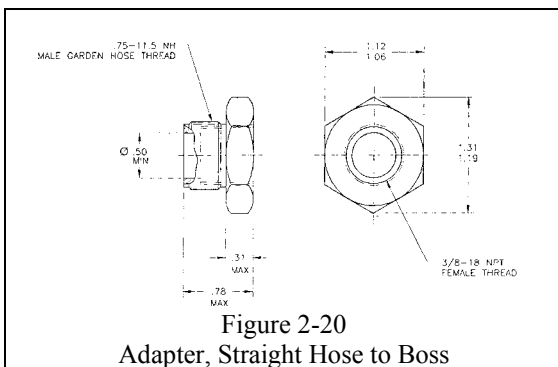


Figure 2-20
Adapter, Straight Hose to Boss

(19) Valve, Check (NSN 4820-01-440-5919, PN: 13229E7197) This valve is used to keep water in the potable hose line from reversing flow.

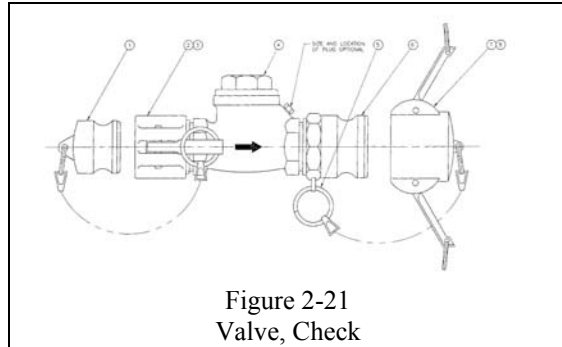


Figure 2-21
Valve, Check

(20) Adapter Assembly, Quick Disconnect, 4" female, 1 1/2" male (NSN: 4730-01-445-5188) (PN: 13229E7190).

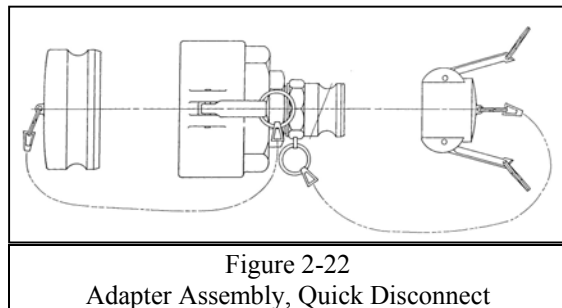


Figure 2-22
Adapter Assembly, Quick Disconnect

(21) Reducer Quick Disconnect, 1" F, 1 1/2" M (NSN: 4730-01-499-8752) (PN: 3629). This fitting is used to connect the Heater, Water, 9,000 Watts (NSN: 4520-01-493-7423) (PN: 111739) to the secondary potable water distribution lines.

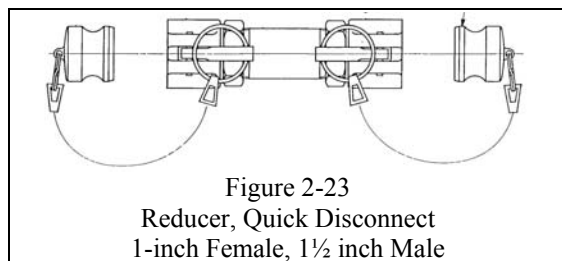


Figure 2-23
Reducer, Quick Disconnect
1-inch Female, 1 1/2 inch Male

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(22) Reducer Quick Disconnect, 1½" F, 1" M (NSN: 4730-01-499-8787) (PN: 3630). This fitting is used to connect the Heater, Water, 9,000 Watts (NSN: 4520-01-493-7423) (PN: 111739) to the secondary potable water distribution lines.

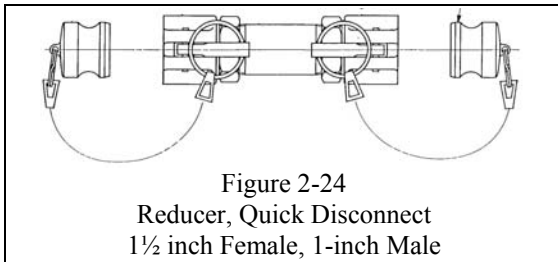


Figure 2-24
Reducer, Quick Disconnect
1½ inch Female, 1-inch Male

e. Other Components

(1) Pipe Assembly, Potable Water (NSN: 4610-01-440-4086, PN: 13229E7162). This component measures the water pressure in the distribution system. This gauge is generally placed at the return end of the main loop. Its precise location depends on how the tanks are employed. **THE PRESSURE GAUGE IS FRAGILE.** When not in use, store it in the Case Electrical-Electronic Test (NSN: 6625-01-449-2857, PN: 13229E7189).

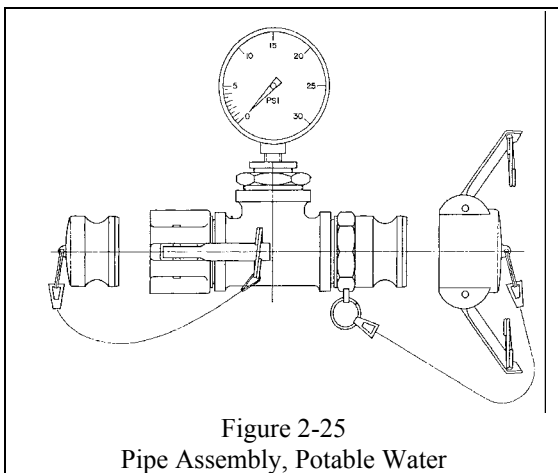


Figure 2-25
Pipe Assembly, Potable Water

(2) Pipe Assembly, Potable Water (NSN: 4610-01-440-4088, PN:

13229E7165). The water distribution system uses a flow meter that measures flow rates up to 100 GPM. It is placed at the end of the primary loop, immediately before the pressure gauge.

FLOW METERS ARE FRAGILE.

When not in use, store them in the Case Electrical-Electronic Test (NSN: 6625-01-449-2857, PN: 13229E7189).

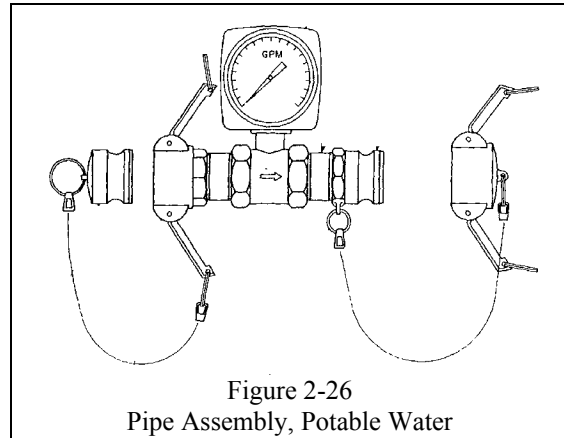


Figure 2-26
Pipe Assembly, Potable Water

(3) Indicator Assembly (NSN: 4610-01-440-4090, PN: 13229E7163). This assembly is used to monitor water flow through the distribution system. **THIS ASSEMBLY IS FRAGILE.** When not in use, store it in the Case Electrical-Electronic Test (NSN: 6625-01-449-2857, PN: 13229E7189).

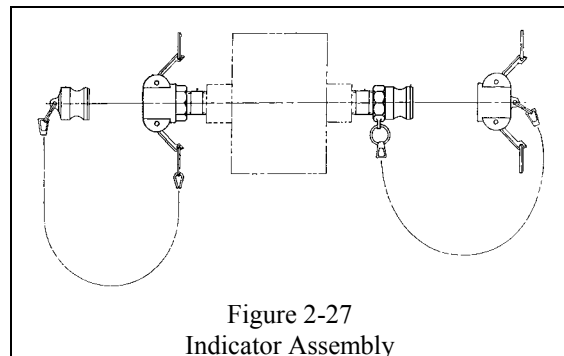
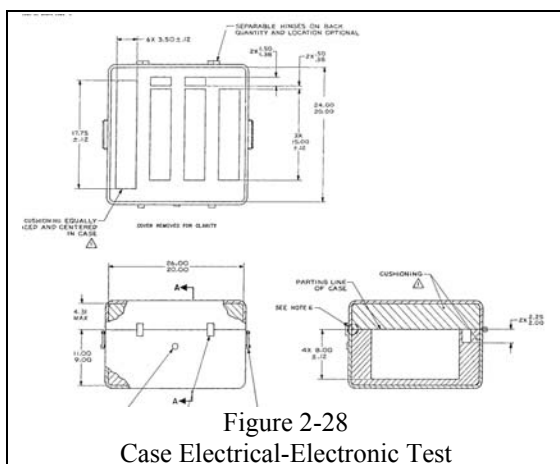


Figure 2-27
Indicator Assembly

(4) Case Electrical-Electronic Test (NSN: 6625-01-449-2857, PN: 13229E7189). This case is used to store the pressure gauges, flow meters,

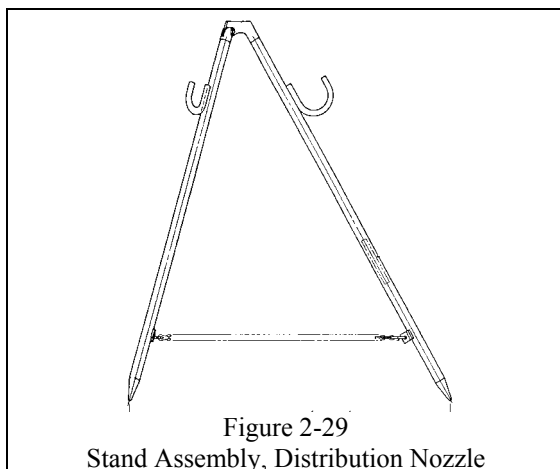
Water Distribution and Wastewater Management System (WDWMS)

indicator assembly and color comparator.



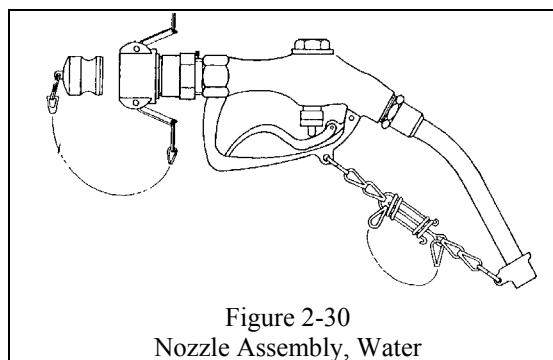
(5) Comparator, Color (NSN: 6630-01-044-0334, PN: U25377). The equipment operator to visually determine the turbidity of the supplied water uses the comparator.

(6) Stand Assembly, Distribution Nozzle (NSN: 4930-01-120-7426, PN: 13225E9140). This assembly is used to suspend the Nozzle Assembly, Water (NSN: 4610-01-440-8834, PN: 13229E7168).

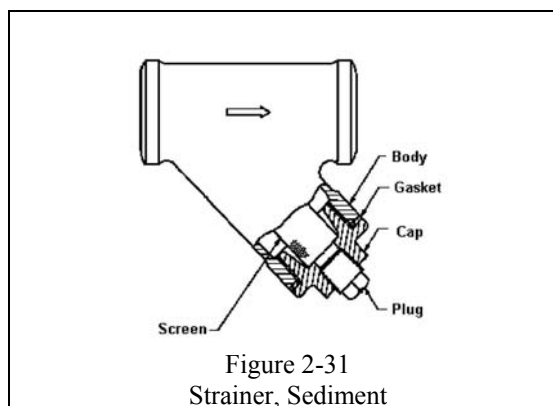


(7) Nozzle Assembly, Water (NSN: 4610-01-440-6834, PN: 13229E7168). The nozzle is provided to

supply water to those parts of the hospital that are not connected to the water distribution system. Other uses for this nozzle are outlined in the principles of installation section of this chapter.



(8) Strainer, Sediment (NSN: 4730-01-440-7662, PN: 13229E7179). This fitting is used to strain or remove large particles that could damage the water pumps in the water distribution system.



(9) Cage, Wire, Folding. This cage is used for the storage of hoses and fittings used in the distribution set.

Water Distribution and Wastewater Management System (WDWWMS)



Figure 2-32
Cage, Wire, Folding

(10) Pump Unit, Centrifugal (NSN: 4320-01-440-4421, PN: 13229E7159). The water pumps are supplied with the water distribution set. The water pumps are outfitted with quick-disconnect (cam-lock) fittings, and are rated at producing a 65 GPM water flow.

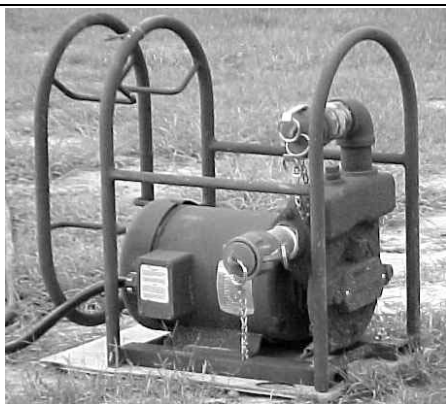


Figure 2-33
Pump Unit, Centrifugal

(11) Hypochlorination Unit (NSN: 4610-01-435-4884, PN: WAL 1031-96). This item is designed to treat and chlorinate the water within the water distribution system. The addition of chlorine based material to the water supply helps retard bacterial and fungal growth within the hoses. It is also

designed to provide the capability to flush (hyper-chlorinate) the water lines.



Figure 2-34
Hypochlorination Unit

(12) Can, Water, Military (NSN: 7240-00-089-3827, PN: MIL-C-43613). This water can is provided for mixing the Sodium hypochlorite (NaOcl) for the Hypochlorination Unit.

(13) Heater, Water, 9,000 Watts (PN: PWH). The, in-line water heater is provided for use of the system during cold weather operations. The heater is not intended to provide “hot” water, but raises the ambient temperature of the water in the hose lines by a few degrees to prevent freezing.



Figure 2-35
Heater, Water, 9,000 Watts

2-3 Principles of Installation

The water distribution set is intended to be as flexible in its layout as the DEPMEDS Combat Support Hospital itself. **THERE IS NO ONE “CORRECT WAY” TO SET UP THE WATER DISTRIBUTION SET.** The number of possible working configurations is almost unlimited. The information within this section provides the basic guidelines necessary for planning the layout for your hospital. Like other large footprint systems, the layout of the WDS must be planned in advance. Obtain a copy of the hospital layout as soon as possible, to determine the best locations (to ensure access to refill the tank(s)) for the major component, the water storage tank(s).

a. Location of Tank(s), Fabric Collapsible. Setting the tank(s) fabric, collapsible is the most important decision in setting up the water distribution set. There are a number of factors to consider.

(1) *Traffic Flow.* Trucks delivering water need access to the tank(s).

(2) *Electric Power.* The Pump

Assembly, Centrifugal (NSN: 4320-01-440-4421), the Hypochlorination Unit (NSN: 4610-01-435-4884) and two Heaters, Water, 9,000 Watts (NSN 4520-01-493-7423) are placed near the tank(s) and they need electric power. The electric cables for pump assembly and heaters are 40 feet long.

(3) *Proximity of the Primary Loop.* The water distribution set is designed for the primary loop to be near the highest concentration of ISOs.

(4) *Sufficient Area.* The water distribution set comes with one Tank, Fabric Collapsible, 20,000 gallon. Each of these tanks is 27.2 feet long and 27.2 feet wide.

c. Location of the Primary Loop. The ISOs make up the largest number of water users in the hospital. As such, they use a large amount of water. For this reason, the primary loop should make its circuit around the highest concentration of ISOs. This approach also has the advantage of reducing the length of the primary loop, as well as reducing the amount of hose needed to connect the ISOs. The number of hospital components being used, and their configuration dictates the length of the primary loop.

d. Secondary Loop(s) Secondary loops are normally installed instead of long one-way water lines. Water constantly moves in the secondary loops. This greatly reduces the amount of stagnant water, and the potential of bacterial and fungal growth. Flowing water stays cooler longer in summer, and resists freezing in winter.

e. Water Distribution Nozzles. The

Water Distribution and Wastewater Management System (WDWMS)

Nozzle Assemblies, Water, (NSN: 4610-01-440-6834) have several applications in the DEPMEDS, Combat Support Hospital.

(1) An important application of the nozzle assembly is to supply water to those areas of the hospital that are not connected to the water distribution set.

(2) The nozzle assembly is an efficient way of filling the autoclaves. Locate a nozzle, with Stand Assembly, Distribution Nozzle (NSN: 4930-01-120-7426) in the vicinity of the Central Materiel Supply (CMS) TEMPER. The hand valve of the nozzle is not very sensitive to small adjustments and tends to give large quantities of water. For this reason you should install a 1 inch female-male Valve, Gate (NSN: 4820-01-440-7798, PN: 13229E7167) in the line leading to the nozzle assembly. Set the gate valve volume to reduce or adjust the flow of the water at the nozzle assembly. Adding this control feature should be at any location where excessive water is a potential problem. Locate the valve 20 feet or so away from the nozzle assembly to enable you to adjust overall flow without moving the valve.

f. Pedestrian and Vehicle Routes. Hoses should not cross vehicle routes. Hoses in pedestrian paths should be kept to a minimum. If a hose must cross a TEMPER, do so in a corridor, and use a Channel, Hose Protector (NSN: 4720-01-440-4925 PN: 13229E7176 or NSN: 4720-01-440-4928 PN: 13229E7175) (Both of these types of channel protectors are contained in the Waste-Water Augmentation Set, Hospital, MF2K.

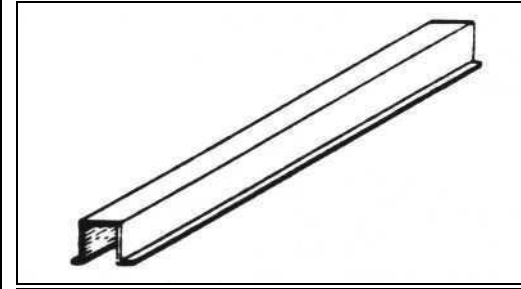


Figure 2-36
Channel, Hose Protector
NSN: 4720-01-440-4925

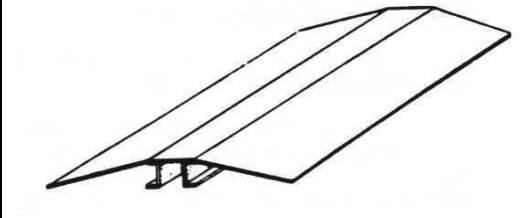


Figure 2-37
Channel, Hose Protector
NSN: 4720-01-440-4928

g. Location of In-Line Water Heaters. The in-line water heaters, supplied with this set are designed to keep the ambient temperature of the water within the hoses and bladders above freezing. The system is designed to have 4 heaters per primary loop, and 4 heaters per secondary loop. They come with cam-lock, quick disconnect fittings, and can be placed at various locations along the loop run. When planning on your setup, remember that these heaters require 208 Volts, AC electrical power and consequently must be located within 40 feet of a power distribution center (PDC). Also, the heaters should be placed as equally as possible along each loop.

2-4. Assembly. This section provides general guidance and some hard rules on how to assemble the water distribution set. Prior to assembly of the WDS, you should determine the layout of the water distribution set based on the information of previous paragraphs, and the

Water Distribution and Wastewater Management System (WDWWMS)

Commander's desired hospital layout. It is helpful to sketch the layout of the water distribution set over the layout diagram of the hospital.

a. Assemble the tank(s) fabric, collapsible, 20,000 Gallon. Locate them using the information in paragraph 2-3a.

(1) Attach one Hose Assembly, Nonmetallic [4" x 20 feet] (NSN: 4720-01-140-6288) to the outlet port of the tank and one Hose Assembly, Nonmetallic [4" x 20 feet] (NSN: 4720-01-140-6288) to the inlet port of the tank.

(2) Attach the Reducer, Quick Disconnect [4 inch female x 2 inch male] (NSN: 4730-01-064-0560) to the Hose Assembly, Nonmetallic [4" x 20 feet] (NSN: 4720-01-140-6288) on the outlet port of the tank

(3) Attach the Reducer, Quick Disconnect [4 inch male x 2 inch female] (NSN: 4730-01-186-0821) to the Hose Assembly, Nonmetallic [4" x 20 feet] (NSN: 4720-01-140-6288) on the inlet port of the tank

(4) Attach the Valve, Gate [2 inch female x 1½ inch male] (NSN: 4820-01-440-8306) to the Reducer, Quick Disconnect [4 inch female x 2 inch male] (NSN: 4730-01-064-0560) on the outlet port of the tank. **(MAKE SURE THE VALVE IS TURNED OFF.)**

(5) Attach the Valve, Gate [1½ inch female x 2 inch male] (NSN: 4820-01-440-8302) Reducer, Quick Disconnect [4 inch male x 2 inch female] (NSN: 4730-01-186-0821) on

the inlet port of the tank. **(MAKE SURE THE VALVE IS TURNED OFF.)**

b. Attach the filter assembly. The location of the filter assembly depends on the configuration of the tanks. But, it should be located between the outlet port of the tank and the Pump Assembly, Centrifugal.

c. Connect the suction hose (1½ inch x 10 feet) between the pump and the assembly for the outlet port of the tank and the pump.

d. Select open 40-60 Ampere female connections on the power distribution panel (PDC). **MAKE SURE THE CIRCUIT BREAKER ON THE PDC IS OFF.** Connect the water pump's and the heaters' electrical plugs to the selected receptacles on the PDC.

NOTE

Do not power any pump until the water system is connected.

NOTE

Do not turn on the heaters until the water system is connected, and water is being pumped.

e. Lay the primary loop following the guidance in paragraph 2-3c. **DO NOT CONNECT ANY HOSES AT THIS TIME. DO NOT REMOVE THE CAPS OR PLUGS.** Be aware of the requirement of fittings near the ISO Container walls that have water receptacles. Connections between hoses in the primary loop should occur near these points. Also be aware of other requirements for breaks in the loop, such as secondary loops, feeder

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lines to individual users, nozzles to CMS, and inclusion of the Heater, Water, 9,000 Watts at various points in the primary and secondary loop(s).

f. Lay the 1 inch hose for the feeder lines between the main loop and the ISOs. This process more clearly defines the needs for breaks in the primary loop and for fittings. The CMS ISO has two water receptacles. All other ISOs have one water receptacle (except for OR, which has none) Place a 1 inch gate valve (NSN: 4820-01-440-7798) next to the tee assembly (NSN: 4730-01-440-4609). Placing the valve here enables you to disconnect an individual ISO without disrupting water supply to the rest of the hospital.

g. Lay the fittings and hose for

the secondary loop(s). The beginning of each secondary loop of each secondary loop is configured

h. The return side of each secondary loop is configured like that shown in Figure

i. Lay the necessary fittings and hose to connect the field sinks.

j. Lay hose lines to the nozzle locations. Place one nozzle next to each CMS tent. These hose lines need enough slack so that the nozzle can reach each autoclave. Place the 1-inch gate valve far enough away from the nozzle so that when the nozzle and hose are moved, the gate valve is not dragged.

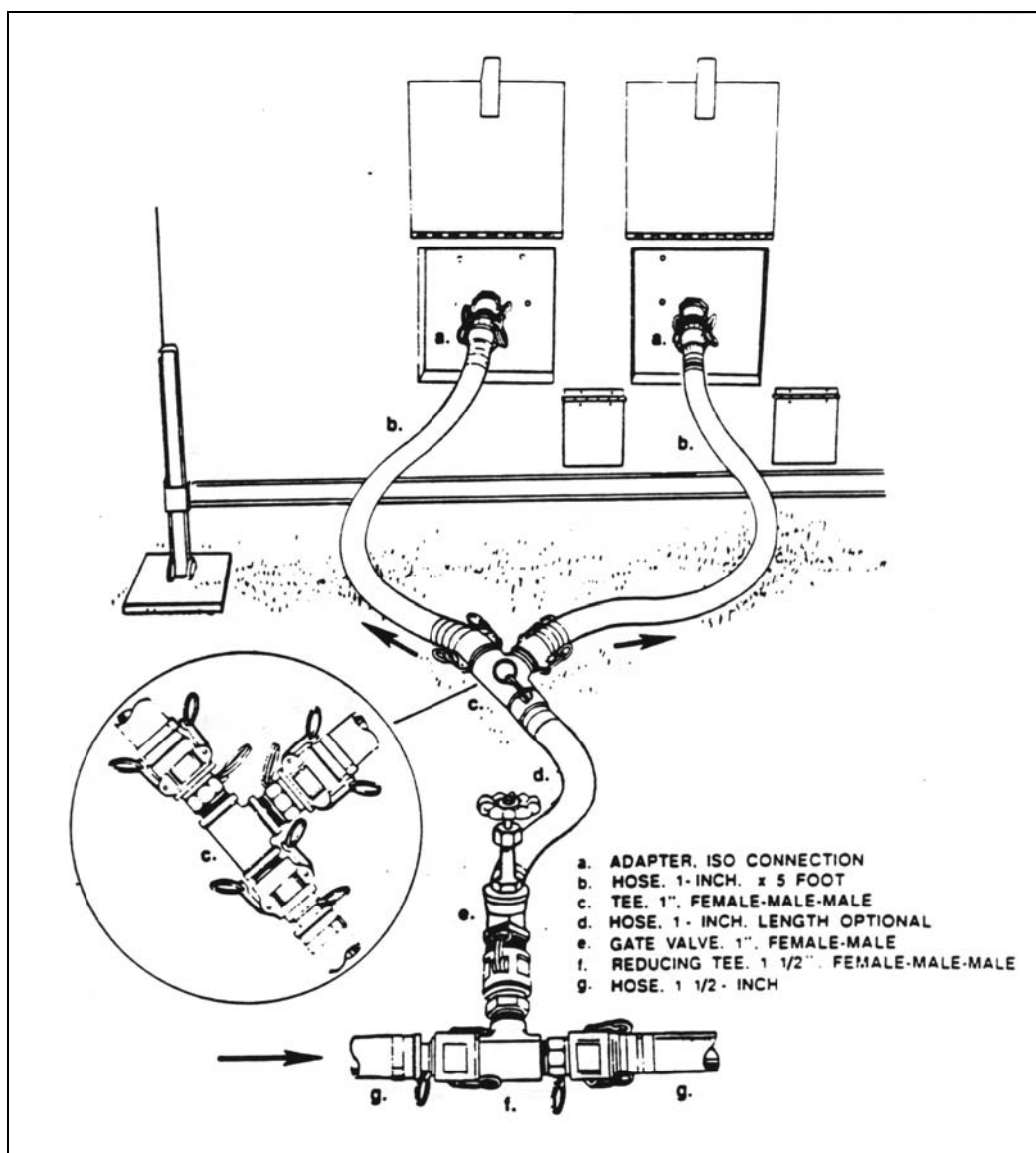


Figure 2-38
Water Hose Connection to the CMS ISO

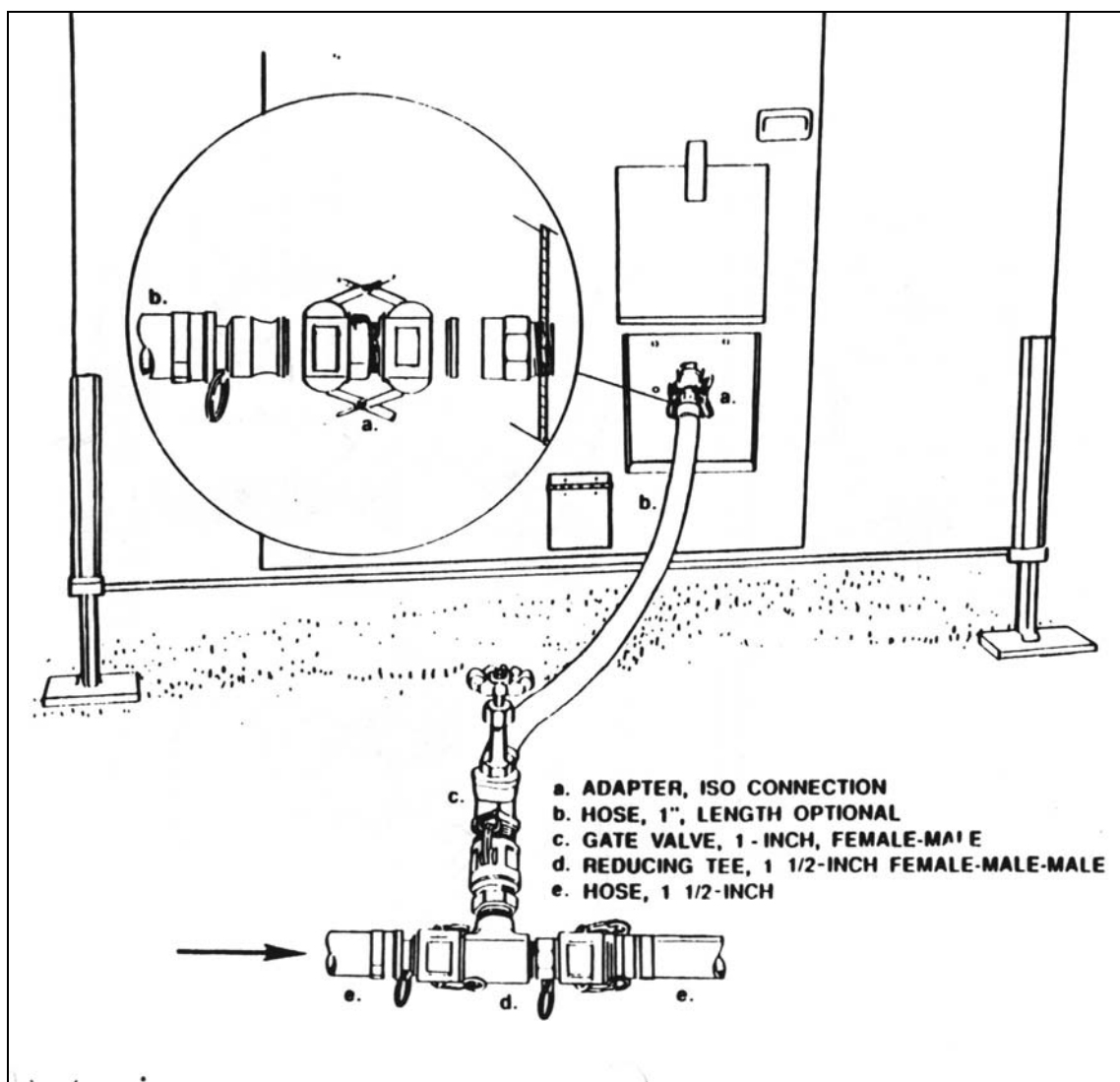


Figure 2-39
Connection to a Single Receptacle ISO (with hose)

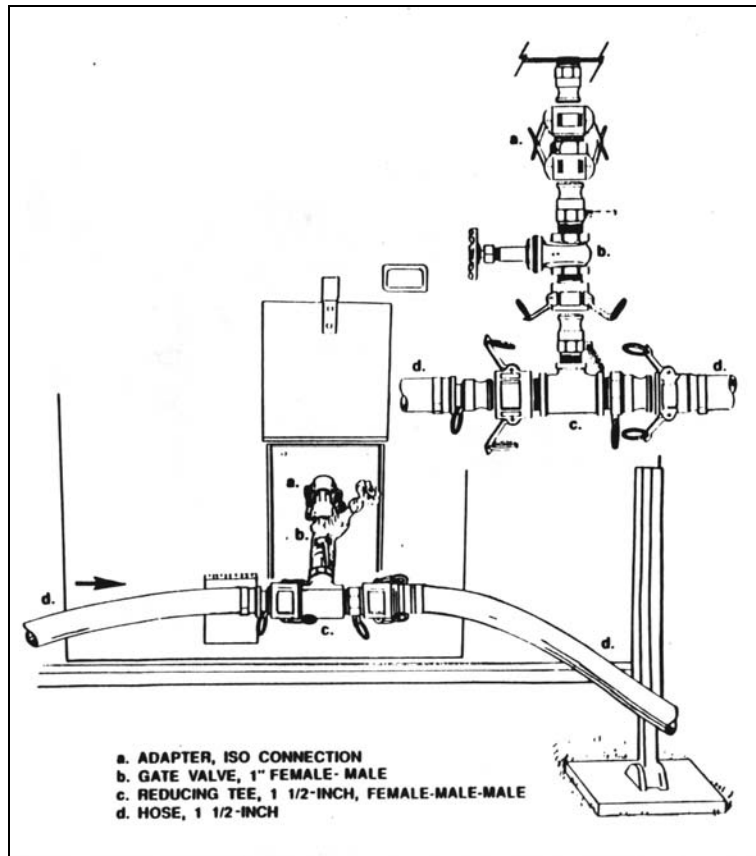


Figure 2-40
Connection to a Single Receptacle ISO (with hose)

k. Use the hose protection channels for hose that will cross TEMPER corridors. If conditions and time permit you may bury the hose and the channel protector, but it is not necessary. Run the hose under the edge of the tent flap and both layers of the floor. You may need to untie the floor tie-downs. Place the protective channel over a hose connection.

l. With the system laid out prepare for the assembly. Correct assembly of the hoses and cam-lock fittings is easier if the fittings are clean. Dirty or mud-encrusted connections must be cleaned off prior to assembly. It is absolutely essential to avoid contaminating the inside of the hoses and fittings. Follow the procedure below as closely as possible.

CAUTION
Correct assembly of connections is essential to avoid contaminating the system.

(1) Open the locking levers for both cam-lock connectors. **DO NOT REMOVE THE FEMALE DUST CAP OR MALE DUST PLUG.**

(2) Place the female connector on an elevated surface (such as the toe of your boot), that allows the opening of the fitting to be face up, or off the ground. This procedure, which applies to all connections, reduces the chance of contaminants entering the fitting.

Water Distribution and Wastewater Management System (WDWWMS)

(3) Lay the male fitting across the female fitting.

(4) Remove the dust plug from the female fitting.

(5) Holding the dust plug in your hand; remove the dust cap from the male fitting.

(6) Connect the dust plug and dust cap to each other. Close the locking levers and lay them on the ground.

(7) Connect the male and female hose connectors or valve fittings without allowing the fittings to touch the ground. Close the locking levers.

(8) If you find dirty connections during the assembly process, ensure that they are cleaned prior to assembly.

(9) Use this procedure to make all the connections in the system. One exception is the connection at the ISO.

The male fitting on the ISO does not have a dust cap. Because of this, the dust plug from the female-female adapter will not have a matching connection.

Final checks to be done **BEFORE TURNING ON THE WATER.**

(1) Open all gate valves in the primary and secondary loop(s), and to the nozzles and ISOs.

(2) Close all valves to the field sinks.

(3) Close the globe valves on the Interior wall panel of the ISO. Ensure the Hamilton sinks are ready by closing the:

(a) Drain cock on the pump.

(b) Valve at the top of the pump body.

(c) Heater drain valve.

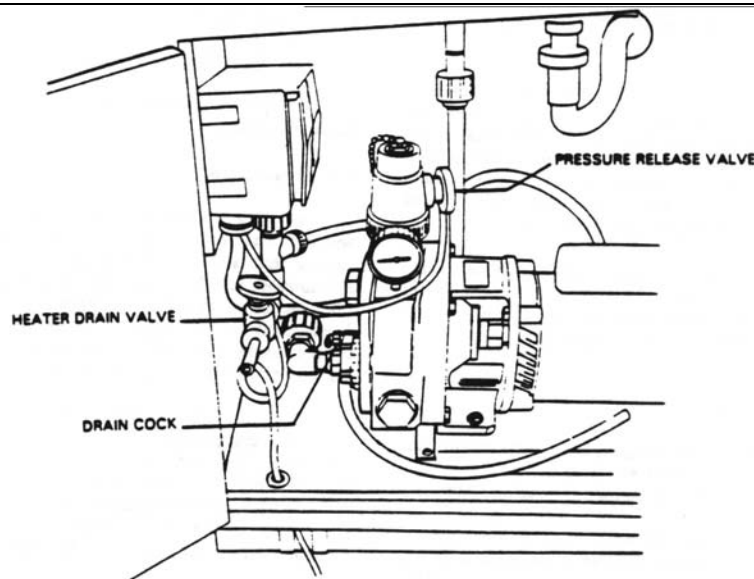
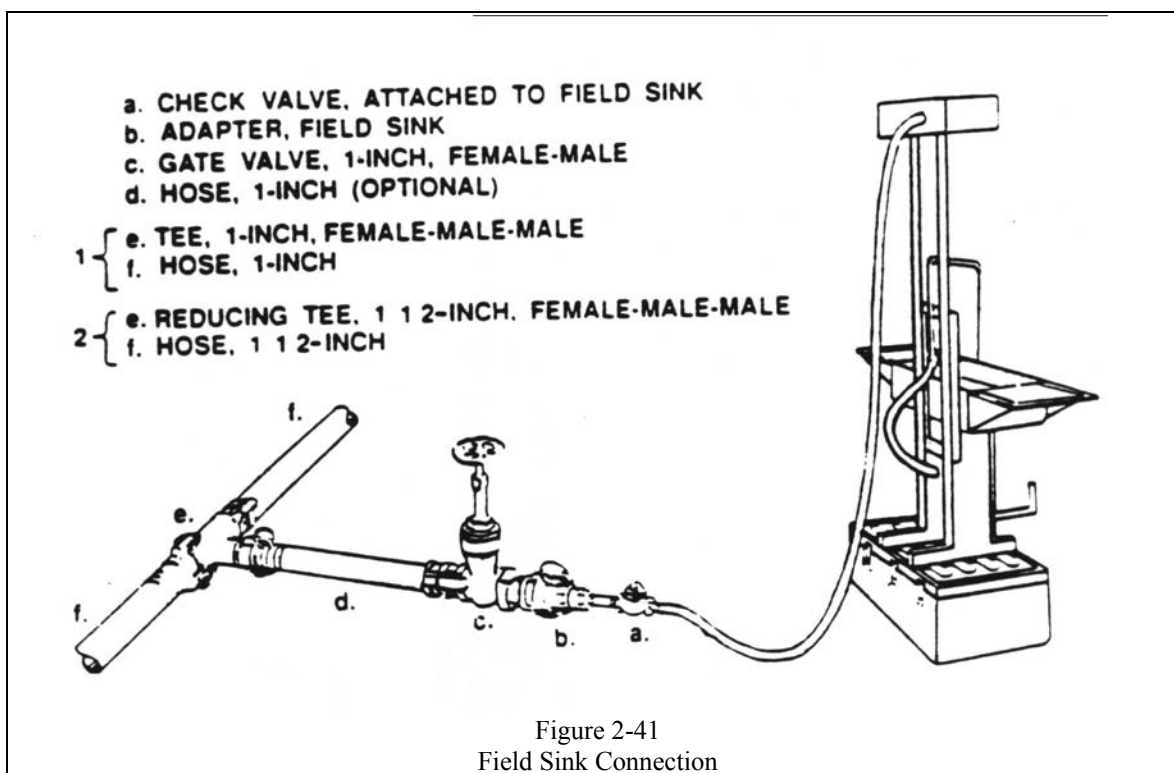


Figure 2-41
Hamilton Sink Connection

Water Distribution and Wastewater Management System (WDWMS)

(4) Make sure that the field sinks are ready. Instruct users of the field sinks connected to the system to set them up

for gravity operation in accordance with the manufacturer's literature.



(5) With water in the storage tank(s) and all of the connections made:

(d) Turn on the circuit for the pump.

(a) Open the valve on the storage tank immediately before the pump.

(e) Turn on the circuit for the Hypochlorinator.

(b) Remove the nut at the top of the pump assembly body. Refer to TM 5-4320-274-14&P. With a water tank full of water, the pump will prime itself. Removing the nut allows air to escape: water fills the pump body. Once water has reached the nut opening, replace the nut and tighten firmly.

(f) Turn on the circuits for the in-line water heaters.

(c) Open the gate valve at the return side of the water tank. If you are using more than one tank, open the valves between the tanks.

l. Adjust the rate of flow at the return side of the distribution system. Adjust the rate of flow with the gate valve so that the pressure gauge reads between 8 and 12 pounds per square inch (psi).

m. Adjust the flow at the secondary loop(s). The presence of water in the secondary loop(s) does not mean that water is flowing through the loop(s). To ensure water is flowing, gradually

close the 1½ inch gate valve. Continue closing the valve until the flowmeter reads between 5 and 10 gallons per minute.

n. Return to the gate valve by the pressure gauge. After adjusting the flow for the secondary loop(s), the flow rate here may need to be adjusted. Use the gate valve to adjust the rate of flow until the pressure gauge reads between 8 and 12 psi.

o. Go to each Hamilton sink. Instruct the users to double-check that the sinks are ready. Have them open the globe valve on the ISO wall. Turn on the water. The initial water from the faucet may appear rusty. This is rust that was on the inside of the body of the pump in the Hamilton sink. Allow the water to run until the water clears.

p. Go to each field sink connected in the water distribution system. Instruct the users to open the gate valve, but not all the way. If there are any leaks anywhere but at the threaded fittings, defer the sink to maintenance. Users can correct leaks at the fittings by tightening them with a pair of pliers. It is up to the user to adjust the rate of flow to the sink with the gate valve.

q. Before the water is used, direct the field sanitation team to test the chlorine in the water storage tank(s). Then operate **EVERY** sink in the system for three to five minutes. Operate each nozzle for one minute. This flushes the system of potential contaminants that may have entered the hoses and fittings since last use.

r. Coordinate with preventive medicine personnel to inspect the system and take water samples. Coordinate also with regular preventive medicine for regular inspections and sampling.

2-5. Operation

The purpose of this paragraph is to ensure that the equipment is operated safely and that the system provides a continuous supply of potable water.

a. Monitor the water supply. Turn off the pump when the depth of water in the water tank is less than 8 inches. The bearings in the water pump will burn out if the pump impeller is not covered with water.

b. The field sanitation team should monitor the chlorine residual in the water supply. Measure chlorine residual at the water tank(s), and 20 percent (20%) of the sinks and nozzles in the distribution system daily. A chlorine residual is essential for preventing biological contamination. However, too high a chlorine residual will make the water taste bad.

c. Remove and clean the filter in the filter assembly daily. This requires shutting down the pumps, hypochlorinator and heaters. In order to minimize downtime, have a clean filter ready for immediate installation. Follow the procedure below to change the filter.

(1) Turn off power to the heaters.

(2) Turn off power to the hypochlorinator.

(3) Turn off the power to the pumps.

Water Distribution and Wastewater Management System (WDWWMS)

(4) Close the gate valve by the filter assembly.

(5) Change filters in the filter assembly.

(6) Open the gate valve.

(7) Prime the pump.

(8) Turn on the power to the pump.

(9) Turn on power to the hypochlorinator.

(10) Turn on power the power to the heaters.

(11) Clean the old filter and place it in the storage container.

2-6. Disassembly.

a. The procedures discussed here will enable you to disassemble the system in a manner that is efficient and minimizes the chance of contamination. The procedure is intended to be independent of any other actions associated with the disassembly of the hospital. However, hose lines located inside a TEMPER must be removed before the tent can be disassembled.

b. Disconnecting the cam-lock fittings is **not** the first thing done in disassembly. However, it is the most frequent task and warrants being discussed first. This procedure is not the reverse of the assembly process previously discussed. The intent is the same though; disconnect with minimal risk of contaminating the system.

(1) Unlock all four locking levers.

(2) Separate the fittings. Rest the female fitting on a protective surface (**NOT ON THE GROUND**) with its opening up. The toe of your boot will work.

(3) Lay the male fitting on the female fitting (or hose) in a way that prevents the male fitting from making contact with anything else.

(4) Separate the dust cap and dust plug. **DO NOT PLACE THEM ON THE GROUND.**

(5) Holding the dust plug, place the dust cap on the male fitting of the cam-lock.

(6) Place the dust plug in the female fitting of the cam-lock.

(7) Close all four locking levers.

c. Turn off power to the heaters.

d. Turn off power to the hypochlorinator.

e. Turn off the pump and close the valves on the water tank(s).

f. Determine the topographical low point in the water distribution system. At this point, disconnect a hose section and permit the water in the hose to drain by gravity. If there is not one clear topographical low point; disconnect the hose at several points to encourage gravity draining.

g. While the hoses are draining, drain the remaining water from the storage tank(s). The location of the tank(s) may not be well suited for emptying their contents in place. You

may wish to connect one or more lengths of discharge hose and drain the tanks away from the hospital. Use the pump to speed up the process. Set the pump up with suction hose, just as when laying the system out. Use as much hose as necessary to drain the tank(s) wherever you wish. **NOTE: Select a drainage location where the slope of the ground will not carry the water into the hospital area. NOTE: As the water storage tank empties, the water pump may become dry and subject to damage. Ensure that the water pump is in the water. Use caution to prevent the pump from running and burning up when the water level in the tank(s) falls below 6 inches.**

h. Once the tank(s) is empty, open the drain cock on the pump and let the pump body drain. Tip the pump up to remove any water remaining in the bottom of the pump body. Leave the drain cock open to allow the pump body to air-dry.

i. While the system is draining, disassemble the hose, starting at the water tank(s).

(1) Remove the gate valves and tee fittings before rolling hoses for storage. Reattach the dust caps and dust plugs to the fittings as you disconnect them. Place the fittings in the Cage, Wire Folding

CAUTION
To prevent contaminants from entering the system, reattach dust caps and dust plugs to fittings and hoses before storage.

(2) When rolling hoses, leave the far end of the hose open to allow any remaining water to drain. If possible, keep that end off the ground. If this is not possible, rinse the end of the hose before attaching the dust cap or dust plug.

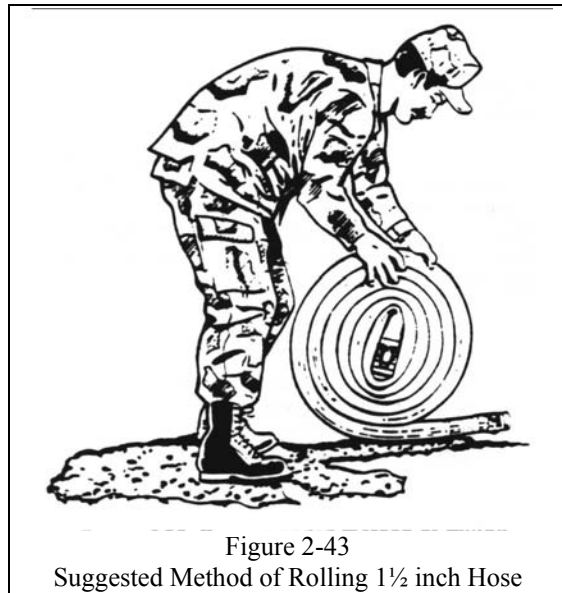


Figure 2-43
Suggested Method of Rolling 1½ inch Hose

(3) Several lengths of short hose can be rolled as one piece.

(4) 1 inch hose cannot be rolled in the same manner as 1½ inch hose. It must be fed into the cage and coiled in layers.

j. Remove the hoses from the inside of the Tempers. The instructions here presume that the hose in the TEMPER is part of a secondary loop.

(1) Close all gate valves. This includes the valves to feeder lines, field sinks, and the valves at the beginning and end of the loop.

(2) Disconnect all feeder lines and field sinks from the secondary loop. Leave gate valves attached to the secondary loop.

(3) Disconnect the cam-lock connections immediately outside each end of the TEMPER. Lift one end of the hose and walk it through the TEMPER. Use caution as the fittings could rip the flooring.

CAUTION
Handle the hose inside the TEMPER with care. The fittings may damage the canvas or flooring.

k. Prior to storing the flowmeters and pressure gauges open the caps and plugs on each item and drain the water. Shake any additional water from each item before replacing the caps and plugs. Store them in the Case, Electrical-Electronic Test (NSN: 6625-01-449-2857, PN: 13229E7189).

l. Advise users of the Hamilton sink to open the drain cock, pressure release valve, and heater drain valve. All of these components are inside the sink base and covered in more detail and discussed in the Hamilton sink operator's manual. These steps allow water to drain from the pump and the heater. This prevents the formation of rust and growth of bacteria.

2-7. Preventive Maintenance.

The following preventative checks and services should be done periodically during operation. They should also be done prior to storing the equipment following completion of a mission or field training exercise.

a. *Water Storage Tanks.* Operator, Maintenance, and PMCS are addressed in the applicable Technical Manuals

b. *Pump.* Operator, Maintenance and PMCS are addressed in TM 5-4320-274-14&P and Chapter 5 of this manual.

c. *Discharge Hose.* Check hoses for abrasions, cuts, and gouges. Check for –

- Presence of bulges or seepage during operations.
- Presence and condition of locking levers.
- Presence and condition of hose clamps.
- Presence of cap and plug attached by chain and key rings.
- Abrasions on cam-lock fittings.
- Presence and condition of gaskets inside the female fittings and caps.

d. *Suction Hose.* Perform the same checks for the discharge hose. The shape of the hose is maintained by steel coils and should be generally round. If the hose is deformed (normally caused by vehicle traffic), use a rubber or lead hammer to restore the cylinder shape of the hose.

e. *Fittings and Valves.* Check –

- For cracks in the body of the fitting or valve.
- For leakage at the threads
- For broken or bent handles on gate valves.

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- To ensure that the nut at the top of the rising stem gate valve is secure.

f. *Gauges and Flowmeters.* In addition to functional checks during normal operations, check for –

- Cracked or broken glass.
- The presence of caps and plugs attached by chain and key rings.
- Presence and condition of gaskets inside the female fittings and caps.

2-8. Repair Procedures.

Part of the Water Distribution and Wastewater Management System (WDWWMS) is the WDWWMS Maintenance Set that includes an assortment of repair parts and critical tools to maintain the system. This set is fielded with the remainder of the system. It is the user's responsibility to replenish the components as needed.

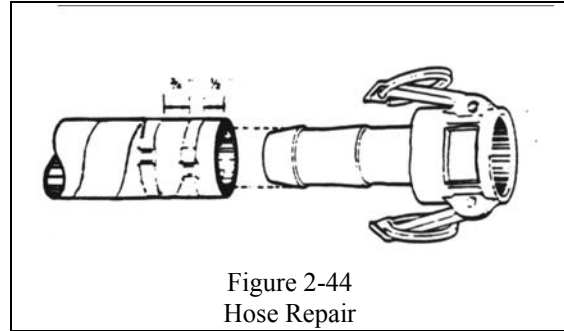
a. *Hose.* The repair procedures discussed here applies to both suction and discharge hoses.

(1) *Broken, torn, or punctured hose.* The principal behind repair services for a damaged hose is to make two good hose sections from one damaged one. Dispose of pieces of hose shorter than 2 feet.

(a) Use a hacksaw to cut the hose and remove the damaged portion.

(b) Place two hose clamps (from the maintenance set) over the newly cut end.

(c) Insert a hose coupling in the newly cut end, as far as it will go. The coupling must be the opposite gender of the cam-lock fitting on the other end of the hose.



(d) Position the hose clamps near the end of the fitting.

(e) Tighten the hose clamps and trim off the excess.

(f) Attach key rings, chain, and caps (or plugs).

(g) Repeat steps (b) through (f) for the other piece of hose.

b. *Fittings and Valves.* Replace missing or damaged caps, plugs, chains, and rings as needed. The complete fittings and valve assemblies are made up of individual parts that may be requisitioned separately. Should a fitting or valve become unserviceable, retain the serviceable parts for use in reassembling the fitting or valve. This can also be applied to the nozzle, flowmeters and pressure gauge.

Chapter 3

WATER DISTRIBUTION SET (WDS)

Medical Re-Engineering Initiative (MRI) 84 Bed Configuration

Operator's, PMCS, and Repair Instruction

3-1. Introduction

a. This chapter describes the assembly, operation, and disassembly of the Water Distribution Set (WDS) (MRI 84 Bed Configuration).

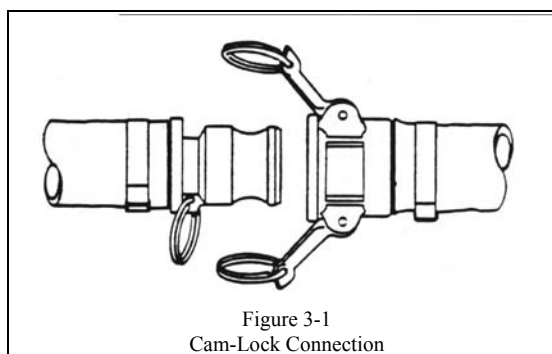
b. The main reason for having a pressurized water distribution system is to control infection and communicable diseases in the hospital. The WDS accomplishes this by starting with covered water storage tanks, pressurizes the water with electric pumps, adds chlorine as necessary, and routes the potable water through a distribution system to designated areas of the hospital.

c. It is necessary that you coordinate early with Preventive Medicine personnel to inspect, take samples from, and analyze the water distribution system. Advise hospital personnel that the water from the system cannot be considered potable until certified by Preventive Medicine personnel.

3-2. Components.

a. *Cam-Lock Connections.* With two exceptions every connection in the water distribution system is connected to similar hoses by use of cam-lock fittings. The exception connects are the field sink adapter and the ISO adapter. Both connections are discussed later in this chapter. Cam-lock is a quick disconnection system that requires no special training or tools. There are no

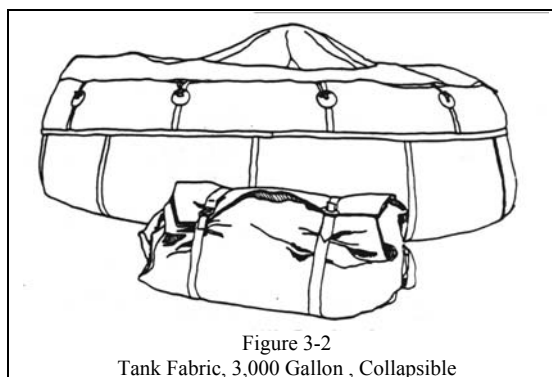
threads on the parts or hoses to be connected. To use cam-lock fittings, the dust cap or plug is removed from each hose end, then insert the male end fitting into the female end of the other fitting. Pull the levers back towards the hose to cam-lock the two parts together. There are some steps to be followed in making and breaking a hose connection. These steps are discussed later in this manual.



b. *Water Storage Tanks.* Units are authorized one of the following types and quantities of water storage tanks.

Types

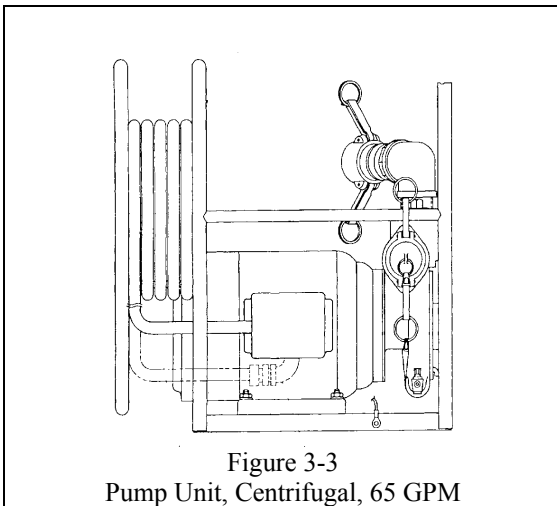
- LIN T19033 – Tank, Fabric, Collapsible, 3,000 Gallon Capacity – 1 each



- Tank, Fabric, Collapsible, 5,000 Gallon Capacity – 1 each

c. *Water Pump.* The water pump used in the WDS (Pump Unit, Centrifugal, 65 GPM [NSN 4320-01-440-4421]) has a 220 volt, 3-phase, totally enclosed, fan-cooled, electric motor. Each water pump is supplied with an integral power cord (40') that terminates in a male Class "L" power connector. The plug interfaces directly with the DEPMEDS electrical distribution system. Each pump is outfitted with a male and female, 1 1/2-inch cam-lock connection. There are two pumps in the WDS. One pump will serve the primary water distribution loop of the hospital, and the other is used to augment or maintain pressure through the secondary loops.

CAUTION
Two persons are required to lift or carry a water pump.



d. *Hoses.* The hoses that are contained within the WDS are:

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8338)
PN: 13225E9136-14
5 feet in length, 1 inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-175-5958)
PN: 13225E9136-12
10 feet in length, 1 inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-177-3714)
PN: 13225E9136-13
20 feet in length, 1 inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8337)
PN: 13225E9136-15
50 feet in length, 1 inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-7779)
PN: 13225E9135-9
10 feet in length, 1½ inch diameter

Hose Assembly, Nonmetallic
(Discharge)
(NSN: 4720-01-438-8343)
PN: 13225E9136-9
10 feet in length, 1½ inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8341)
PN: 13225E9136-10
20 feet in length, 1½ inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8335)
PN: 13225E9136-18
50 feet in length, 1½ inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-140-6288)
PN: 13225E9136-4
20 feet in length, 4-inch diameter

Water Distribution and Wastewater Management System (WDWMS)

e. *Fittings and Valves.* There are numerous fittings and valves within the WDS. With two exceptions every fitting in the set has cam-lock connections.

(1) Reducer, Quick Disconnect, 4-inch female, 2-inch male (NSN: 4730-01-064-0560) (PN: AA59326XI-1-9). This reducer is used on the supply side of the Tank, Fabric, Collapsible 5,000-gallon. **NOTE: Some valves and fitting descriptions are identified with the letter F for female and M for male connections.**

(2) Reducer, Quick Disconnect, 4-inch male, 2-inch female (NSN: 4730-01-064-0821) (PN: AA59326XI-1-10). This reducer is used on the supply side of the Tank, Fabric, Collapsible 5,000-gallon.

(3) Valve, Gate, 2 inch female, 1 ½ inch male (NSN 4820-01-440-8306) (PN 13229E7178). This valve is used on the output of Tank Assembly, Fabric Collapsible (3,000 gallon) (LIN: TT19033, NSN: 5430-01-170-6983) or Tank Assembly, Fabric Collapsible (5,000 gallon).

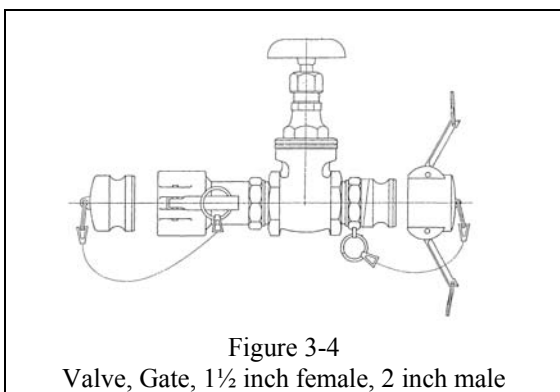


Figure 3-4
Valve, Gate, 1½ inch female, 2 inch male

(4) Valve, Gate, 1 ½ inch female, 2 inch male (NSN: 4820-01-440-8302, PN 13229E7177). This valve is used on the return of Tank Assembly, Fabric

Collapsible (3,000 gallon) (LIN: TT19033, NSN: 5430-01-170-6983) or Tank Assembly, Fabric Collapsible (5,000 gallon).

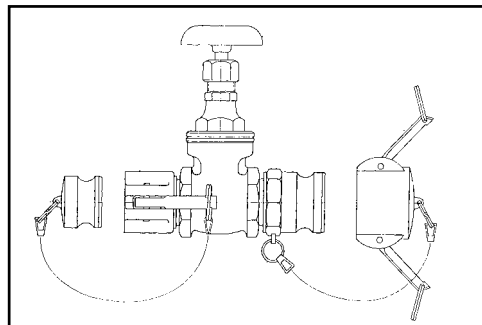


Figure 3-5
Valve, Gate, 1½ inch male, 2 inch female

(5) Valve, Globe, 1½ inch female, 1½ inch male (NSN: 4820-01-440-8765, PN: 13229E7169). This valve is attached to the 1½ inch loop, immediately after the beginning of a 1-inch loop. The valve is manually adjusted to control the rate of flow in the system.

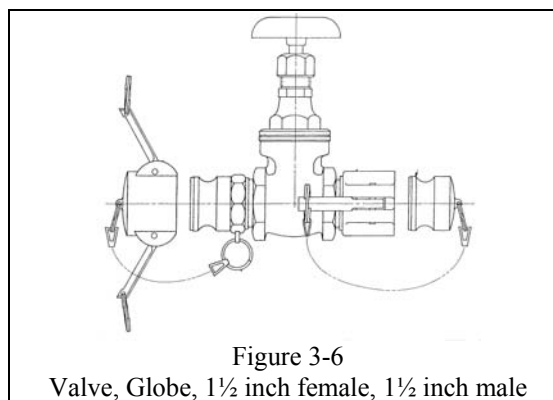
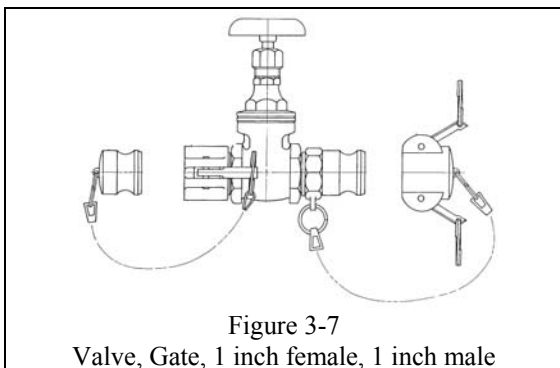


Figure 3-6
Valve, Globe, 1½ inch female, 1½ inch male

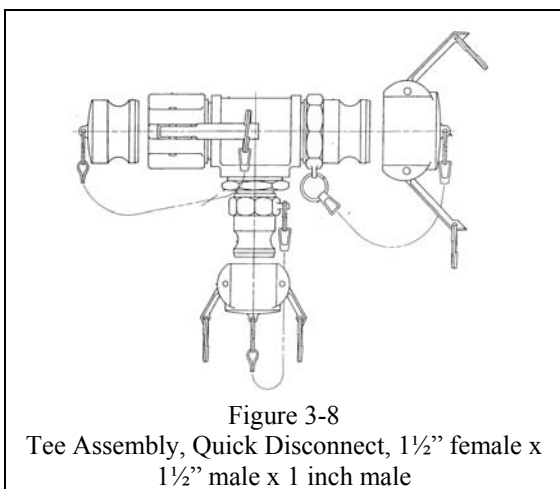
(6) Valve, Gate, 1 inch female, 1 inch male (NSN: 4820-01-440-7798, PN: 13229E7167). When used with individual water users, such as field sinks and nozzles, this valve controls the rate of flow. It is also used at the beginning of secondary loops and long one-way water lines. Used this way, repairs or changes in the secondary loops

Water Distribution and Wastewater Management System (WDWMS)

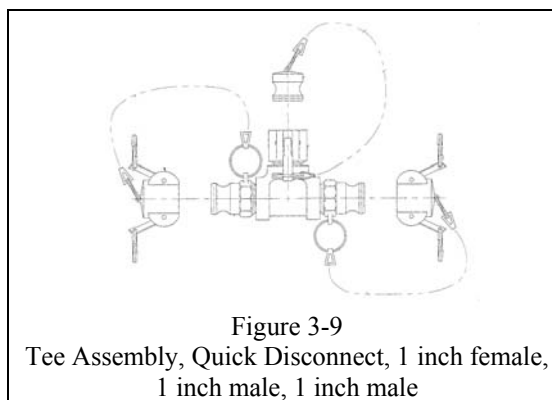
can be made without interrupting water supply to the rest of the hospital.



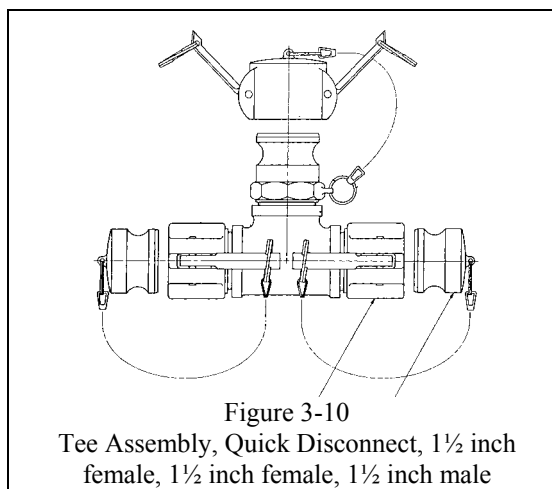
(7) Tee Assembly, Quick Disconnect, 1½" female x 1½" male x 1 inch male (NSN: 4730-01-440-4609, PN: 13229E7172). This fitting is used at each place where the one-way feeder lines branch off to the individual users, such as CMS, pharmacy, X-Ray, laboratory, etc. It is also used at the beginning and end of the secondary loop.



(8) Tee Assembly, Quick Disconnect, 1 inch female, 1 inch male, 1 inch male (NSN: 4730-01-440-4091, PN: 13229E0361). This fitting allows connection of the individual users along secondary loops or long one-way lines.



(9) Tee Assembly, Quick Disconnect, 1½ inch female, 1½ inch female, 1½ inch male (NSN: 4730-01-440-4615, PN: 13229E7181). This fitting is located between the Tank Assembly, Fabric Collapsible (3,000 Gallon) (LIN: T19033, NSN: 5430-01-170-6984) or Tank Assembly, Fabric Collapsible (5,000 gallon) and the Pump 65 GPM [NSN 4320-01-440-4421] when two or more Tank Assemblies employed in parallel.



(10) Tee Assembly, Quick Disconnect, 1½ inch female, 1½ inch male x ¼ inch male (NSN: 4730-01-487-3575) is used to connect the Hypochlorination Unit (NSN: 4610-01-435-4884) (PN: WAL-1031-96) to the primary loop.

Water Distribution and Wastewater Management System (WDWWMS)

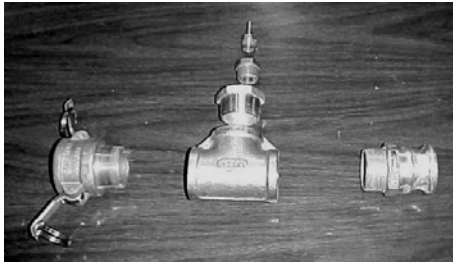


Figure 3-11

Tee Assembly, Quick Disconnect, 1 1/2 inch female, 1 1/2 inch male x 1/4 inch male

(11) Coupling Assembly, Quick Disconnect, 1 inch female x 1 inch female (NSN: 4730-01-440-8569, PN: 13229E7173). This coupler is commonly referred to as a “Gender Changer”. It is used when a male outlet is connected to a second male connection and as a connection on the Hamilton Sink connections for the ISO containers.

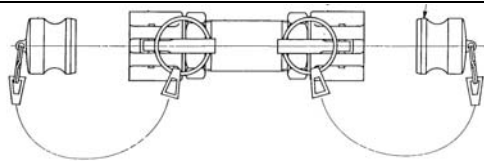


Figure 3-12

Coupling Assembly, Quick Disconnect, 1 inch female x 1 inch female

(12) Plug, Quick Disconnect (NSN: 4730-01-415-6403, PN: 13229E7170). This fitting is used in conjunction with Adapter, Straight Hose to Boss (NSN: 4730-01-415-6420, PN: 13229E7195) to connect field sinks to the water loop.

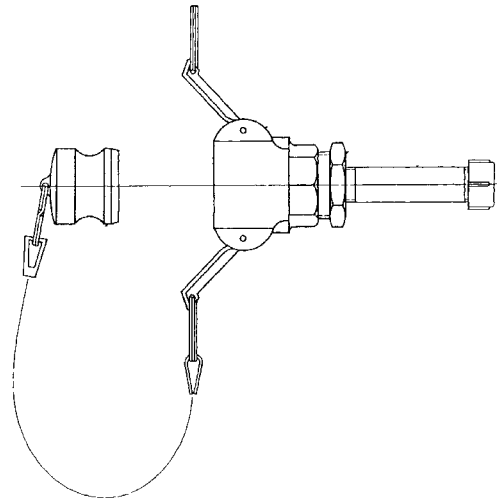


Figure 3-13

Plug, Quick Disconnect

(13) Adapter, Straight Hose to Boss (NSN: 4730-01-415-6420, PN: 13229E7195). This fitting is used in conjunction with Plug, Quick Disconnect (NSN: 4730-01-415-6403, PN: 13229E7170) to connect field sinks to the water loop. This is the first example where both connections are not cam-lock.

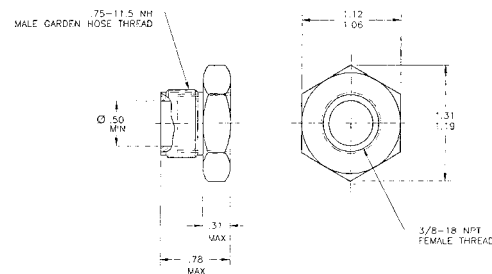


Figure 3-14

Adapter, Straight Hose to Boss

(14) Valve, Check (NSN 4820-01-440-5919, PN: 13229E7197) This valve is used to keep water in the potable hose line from reversing flow.

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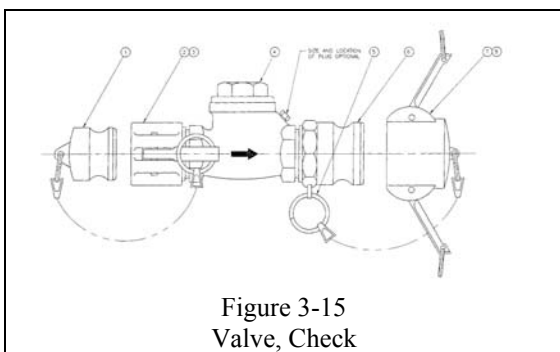


Figure 3-15
Valve, Check

(15) Adapter Assembly, Quick Disconnect, 4" female, 1½" male (NSN: 4730-01-445-5188) (PN: 13229E7190).

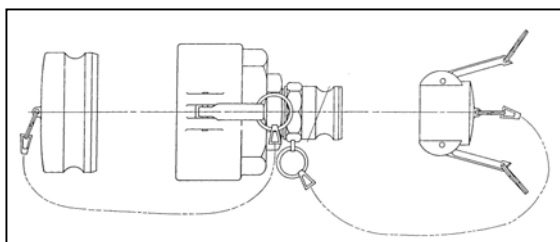


Figure 3-16
Adapter Assembly, Quick Disconnect

(16) Reducer Quick Disconnect, 1"F, 1½" M (NSN: 4730-01-499-8752) (PN: 3629). This fitting is used to connect the Heater, Water, 9,000 Watts (NSN: 4520-01-493-7423) (PN: 111739) to the secondary potable water distribution lines.

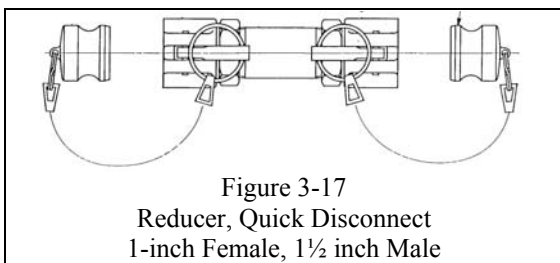


Figure 3-17
Reducer, Quick Disconnect
1-inch Female, 1½ inch Male

(17) Reducer Quick Disconnect, 1½"F, 1" M (NSN: 4730-01-499-8787) (PN: 3630). This fitting is used to connect the Heater, Water, 9,000 Watts (NSN: 4520-01-493-7423) (PN: 111739) to the secondary potable water distribution lines.

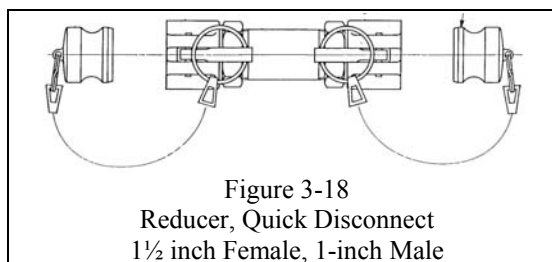


Figure 3-18
Reducer, Quick Disconnect
1½ inch Female, 1-inch Male

f. Other Components

(1) Pipe Assembly, Potable Water (NSN: 4610-01-440-4086, PN: 13229E7162). This component measures the water pressure in the distribution system. This gauge is generally placed at the return end of the main loop. Its precise location depends on how the tanks are employed. **THE PRESSURE GAUGE IS FRAGILE.** When not in use, store it in the Case Electrical-Electronic Test (NSN: 6625-01-449-2857, PN: 13229E7189).

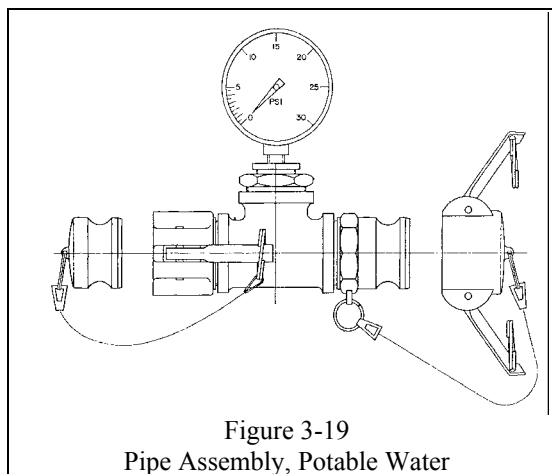


Figure 3-19
Pipe Assembly, Potable Water

(2) Pipe Assembly, Potable Water (NSN: 4610-01-440-4088, PN: 13229E7165). The water distribution system uses a flow meter that measures flow rates up to 100 GPM. It is placed at the end of the primary loop, immediately before the pressure gauge. **FLOW METERS ARE FRAGILE.** When not in use, store them in the Case

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Electrical-Electronic Test (NSN: 6625-01-449-2857, PN: 13229E7189).

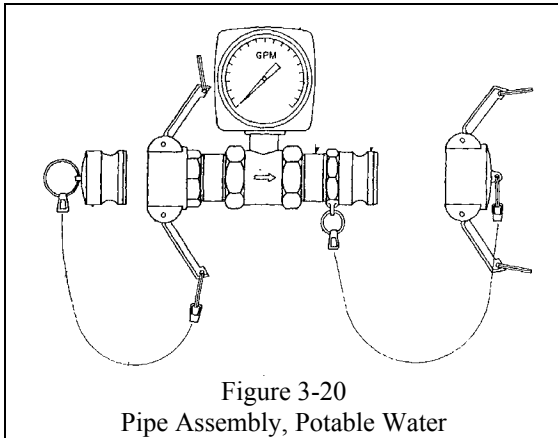


Figure 3-20

Pipe Assembly, Potable Water

(3) Indicator Assembly (NSN: 4610-01-440-4090, PN: 13229E7163). This assembly is used to monitor water flow through the distribution system. **THIS ASSEMBLY IS FRAGILE.** When not in use, store it in the Case Electrical-Electronic Test (NSN: 6625-01-449-2857, PN: 13229E7189).

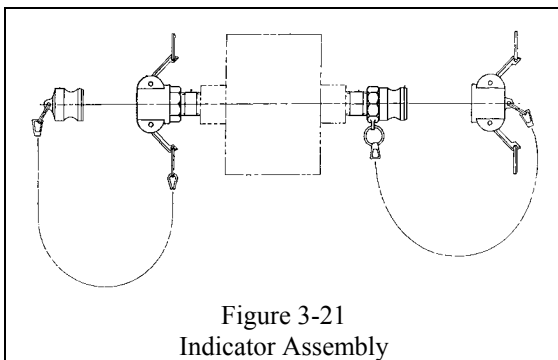


Figure 3-21

Indicator Assembly

(4) Case Electrical-Electronic Test (NSN: 6625-01-449-2857, PN: 13229E7189). This case is used to store the pressure gauges, flow meters, indicator assembly and color comparator.

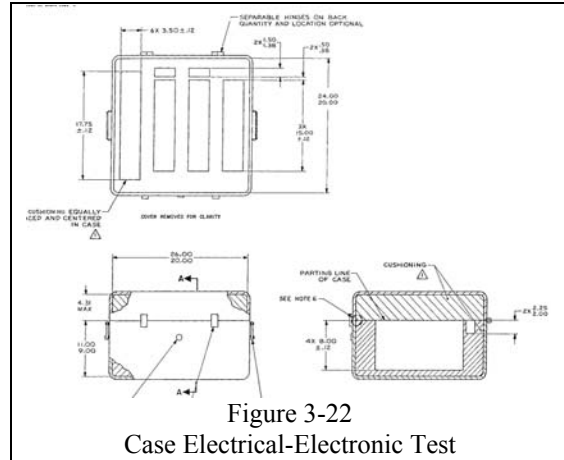


Figure 3-22

Case Electrical-Electronic Test

(5) Comparator, Color (NSN: 6630-01-044-0334, PN: U25377). The equipment operator to visually determine the turbidity of the supplied water uses the comparator.

(6) Stand Assembly, Distribution Nozzle (NSN: 4930-01-120-7426, PN: 13225E9140). This assembly is used to suspend the Nozzle Assembly, Water (NSN: 4610-01-440-8834, PN: 13229E7168).

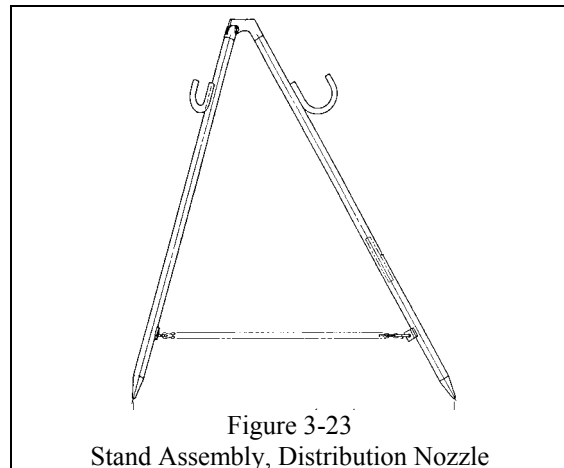


Figure 3-23

Stand Assembly, Distribution Nozzle

(7) Nozzle Assembly, Water (NSN: 4610-01-440-6834, PN: 13229E7168). The nozzle is provided to supply water to those parts of the hospital that are not connected to the water distribution system. Other uses

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for this nozzle are outlined in the principles of installation section of this chapter.

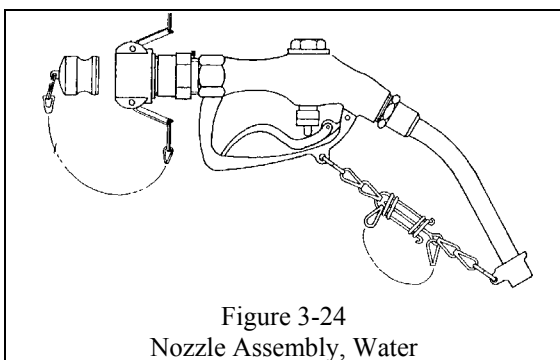


Figure 3-24
Nozzle Assembly, Water

(8) Strainer, Sediment (NSN: 4730-01-440-7662, PN: 13229E7179). This fitting is used to strain or remove large particles that could damage the water pumps in the water distribution system.

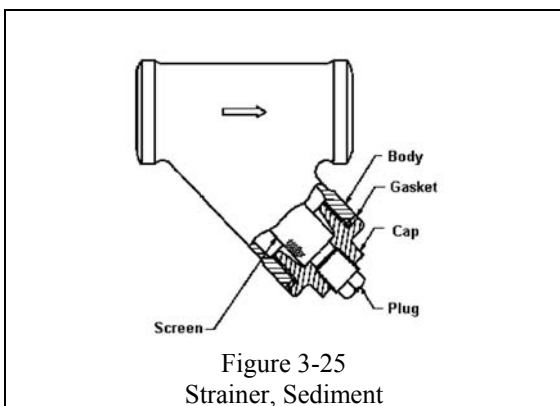


Figure 3-25
Strainer, Sediment

(9) Cage, Wire Folding. This cage is used to store hoses and fittings of the water set.

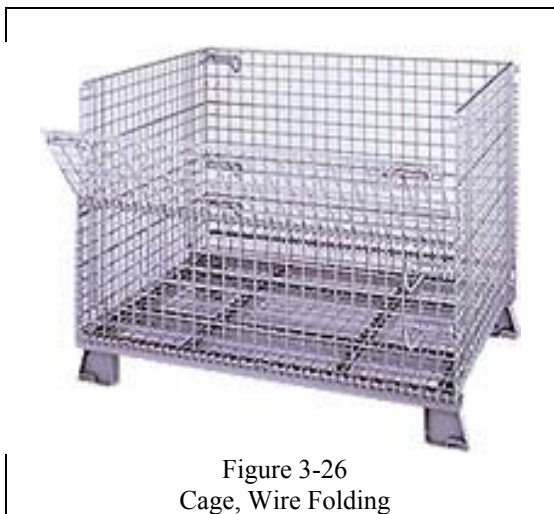


Figure 3-26
Cage, Wire Folding

(10) Pump Unit, Centrifugal (NSN: 4320-01-440-4421, PN: 13229E7159). The water pumps are supplied with the water distribution set. The water pumps are outfitted with quick-disconnect (cam-lock) fittings, and are rated at producing a 65 GPM water flow.

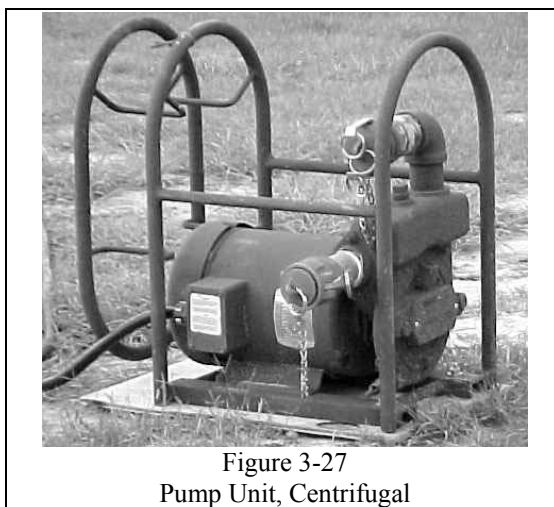


Figure 3-27
Pump Unit, Centrifugal

(11) Hypochlorination Unit (NSN: 4610-01-435-4884, PN: WAL 1031-96). This item is designed to treat and chlorinate the water within the water distribution system. The addition of chlorine based material to the water supply helps retard bacterial and fungal growth within the hoses. It is also

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designed to provide the capability to flush (hyper-chlorinate) the water lines.



Figure 3-28
Hypochlorination Unit

(12) Can, Water, Military (NSN: 7240-00-089-3827, PN: MIL-C-43613). This water can is provided for mixing the Sodium Hypochlorite (NaOcl) for the Hypochlorination Unit.

(13) Heater, Water, 9,000 Watts (PN: PWH). The, in-line water heater is provided for use of the system during cold weather operations. The heater is not intended to provide “hot” water, but raises the ambient temperature of the water in the hose lines by a few degrees to prevent freezing.



Figure 3-29
Heater, Water, 9,000 Watts

3-3. Principles of Installation

The water distribution set is intended to be as flexible in its layout as the DEPMEDS Combat Support Hospital itself. **THERE IS NO ONE “CORRECT WAY” TO SET UP THE WATER DISTRIBUTION SET.** The number of possible working configurations is almost unlimited. The information within this section provides the basic guidelines necessary for planning the layout for your hospital. Like other large footprint systems, the layout of the WDS must be planned in advance. Obtain a copy of the hospital layout as soon as possible, to determine the best locations (to ensure access to refill the tank(s)) for the major component, the water storage tank(s).

a. Location of Tank(s), Fabric Collapsible. Setting the tank(s) fabric, collapsible is the most important decision in setting up the water distribution set. There are a number of factors to consider.

(1) *Traffic Flow.* Trucks delivering water need access to the tank(s).

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(2) *Electric Power.* The Pump Assembly, Centrifugal (NSN 4320-01-440-4421), the heater (NSN 4520-01-492-7423), and the Hypochlorination Unit (NSN: 4610-01-435-4884) are placed next to the tank(s) and they need electric power. The electric cables for pump assembly is 40 feet long, and the cable for the Hypochlorination unit is 80 feet long.

(3) *Proximity of the Primary Loop.* The water distribution set is designed for the primary loop to be near the highest concentration of ISOs.

(4) *Sufficient Area.* The water distribution set comes with either one Tank, Fabric Collapsible, 3,000 gallon (which is 13.8 feet long by 13.8 feet wide) or one Tank, Fabric Collapsible, 5,000 gallon (which is 16.3 feet long by 16.3 feet wide).

g. Location of the Primary Loop. The ISOs make up the largest number of water users in the hospital. As such, they use a large amount of water. For this reason, the primary loop should make its circuit around the highest concentration of ISOs. This approach also has the advantage of reducing the length of the primary loop, as well as reducing the amount of hose needed to connect the ISOs. The number of hospital components being used, and their configuration dictates the length of the primary loop.

h. Secondary Loop(s) Secondary loops are normally installed instead of long one-way water lines. Water constantly moves in the secondary loops. This greatly reduces the amount of stagnant water, and the potential of bacterial and fungal growth. Flowing

water stays cooler longer in summer, and resists freezing in winter.

i. Water Distribution Nozzles. The Nozzle Assemblies, Water, (NSN: 4610-01-440-6834) have several applications in the DEPMEDS, Combat Support Hospital.

(1) An important application of the nozzle assembly is to supply water to those areas of the hospital that are not connected to the water distribution set.

(2) The nozzle assembly is an efficient way of filling the autoclaves. Locate a nozzle, with Stand Assembly, Distribution Nozzle (NSN: 4930-01-120-7426) in the vicinity of the Central Materiel Supply (CMS) TEMPER. The hand valve of the nozzle is not very sensitive to small adjustments and tends to give large quantities of water. For this reason you should install a 1 inch female-male Valve, Gate (NSN: 4820-01-440-7798, PN: 13229E7167) in the line leading to the nozzle assembly. Set the gate valve volume to reduce or adjust the flow of the water at the nozzle assembly. Adding this control feature should be at any location where excessive water is a potential problem. Locate the valve 20 feet or so away from the nozzle assembly to enable you to adjust overall flow without moving the valve.

j. Pedestrian and Vehicle Routes. Hoses should not cross vehicle routes. Hoses in pedestrian paths should be kept to a minimum. If a hose must cross a TEMPER, do so in a corridor, and use a Channel, Hose Protector (NSN: 4720-01-440-4925 PN: 13229E7176 or NSN: 4720-01-440-4928 PN: 13229E7175) (Both of these types of channel protectors are contained in the Waste-

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Water Augmentation Set, Hospital, MF2K.

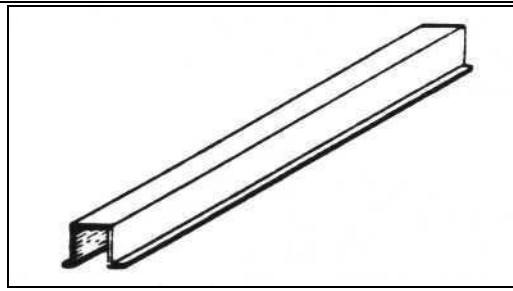


Figure 3-30
Channel, Hose Protector
NSN: 4720-01-440-4925

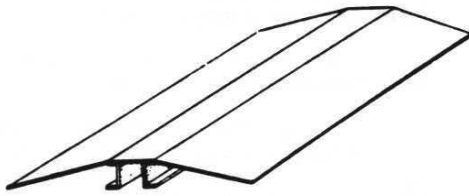


Figure 3-31
Channel, Hose Protector
NSN: 4720-01-440-4928

k. Location of In-Line Water Heaters. The in-line water heaters, supplied with this set are designed to keep the ambient temperature of the water within the hoses and bladders above freezing. The system is designed to have 4 heaters per primary loop, and 4 heaters per secondary loop. They come with cam-lock, quick disconnect fittings, and can be placed at various locations along the loop run. When planning on your setup, remember that these heaters require 208 Volts, AC electrical power and consequently must be located within 40 feet of a power distribution center (PDC). Also, the heaters should be placed as equally as possible along each loop.

3-4. Assembly. This section provides general guidance and some hard rules on how to assemble the water distribution set. Prior to assembly of the WDS, you

should determine the layout of the water distribution set based on the information of previous paragraphs, and the Commander's desired hospital layout. It is helpful to sketch the layout of the water distribution set over the layout diagram of the hospital.

a. Assemble the tank(s) fabric, collapsible, 3,000 Gallon or tank(s) fabric, collapsible, 5,000 Gallon. Locate them using the information in paragraph 3-3a.

(1) Attach the Valve, Gate [2-inch female x 1½ inch male] (NSN: 4820-01-440-8306) to the tank, fabric collapsible on the outlet port of the tank. **(MAKE SURE THE VALVE IS TURNED OFF.)**

(2) Attach the Valve, Gate [1½ inch female x 2-inch male] (NSN: 4820-01-440-8302) to the tank, fabric, collapsible on the inlet port of the tank. **(MAKE SURE THE VALVE IS TURNED OFF.)**

b. Attach the strainer, sediment (NSN 4730-01-440-7662). The location of the strainer depends on the configuration of the tanks. But, it should be located between the outlet port of the tank and the Pump Assembly, Centrifugal.

c. Connect the suction hose (1½ inch x 10 feet) between the pump and the assembly for the outlet port of the tank and the pump.

d. Select open 40-60 Ampere female connections on the power distribution panel (PDC). **MAKE SURE THE CIRCUIT BREAKER ON THE PDC IS OFF.** Connect the

Water Distribution and Wastewater Management System (WDWWMS)

water pump's and heater electrical plug to the selected receptacle on the PDC.

NOTE

Do not power any pump until the water system is connected.

NOTE

Do not power any heater until the water system is connected and pumping water.

e. Lay the primary loop following the guidance in paragraph 3-3c. **DO NOT CONNECT ANY HOSES AT THIS TIME. DO NOT REMOVE THE CAPS OR PLUGS.** Be aware of the requirement of fittings near the ISO Container walls that have water receptacles. Connections between hoses in the primary loop should occur near these points. Also be aware of other requirements for breaks in the loop, such as secondary loops, feeder lines to individual users, nozzles to CMS, and inclusion of the Heater, Water, 9,000 Watts at various points in the primary and secondary loop(s).

f. Lay the 1-inch hose for the feeder lines between the main loop and the ISOs. This process more clearly defines the needs for breaks in the

primary loop and for fittings. The CMS ISO has two water receptacles. All other ISOs have one water receptacle (except for OR, which has none) Place a 1-inch gate valve (NSN: 4820-01-440-7798) next to the tee assembly (NSN: 4730-01-440-4609). Placing the valve here enables you to disconnect an individual ISO without disrupting water supply to the rest of the hospital.

g. Lay the fittings and hose for the secondary loop(s). The beginning of each secondary loop of each secondary loop is configured

h. The return side of each secondary loop is configured like that shown in the figure below.

i. Lay the necessary fittings and hose to connect the field sinks.

j. Lay hose lines to the nozzle locations. Place one nozzle next to each CMS tent. These hose lines need enough slack so that the nozzle can reach each autoclave. Place the 1-inch gate valve far enough away from the nozzle so that when the nozzle and hose are moved, the gate valve is not dragged.

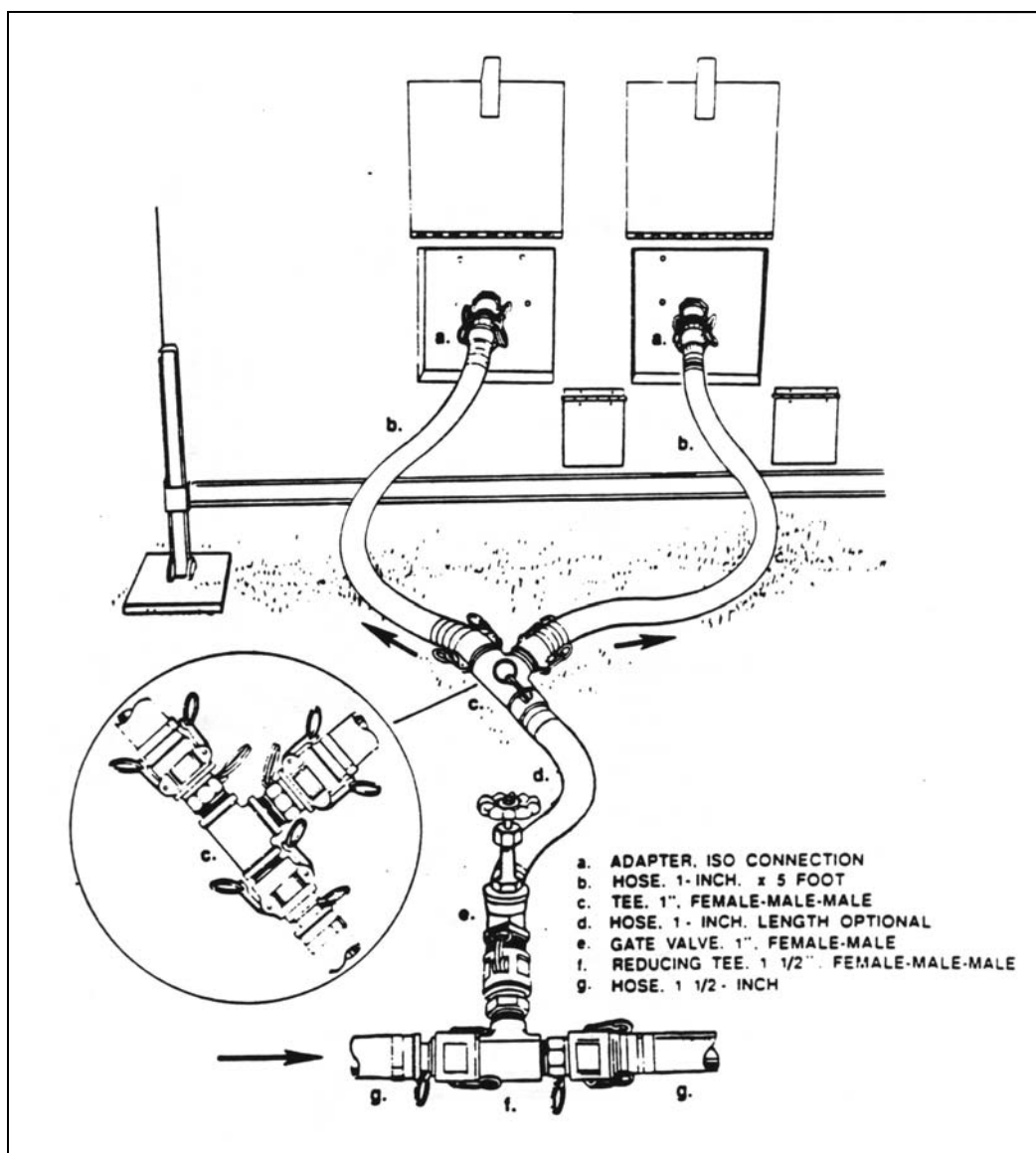


Figure 3-32
Water Hose Connection to the CMS ISO

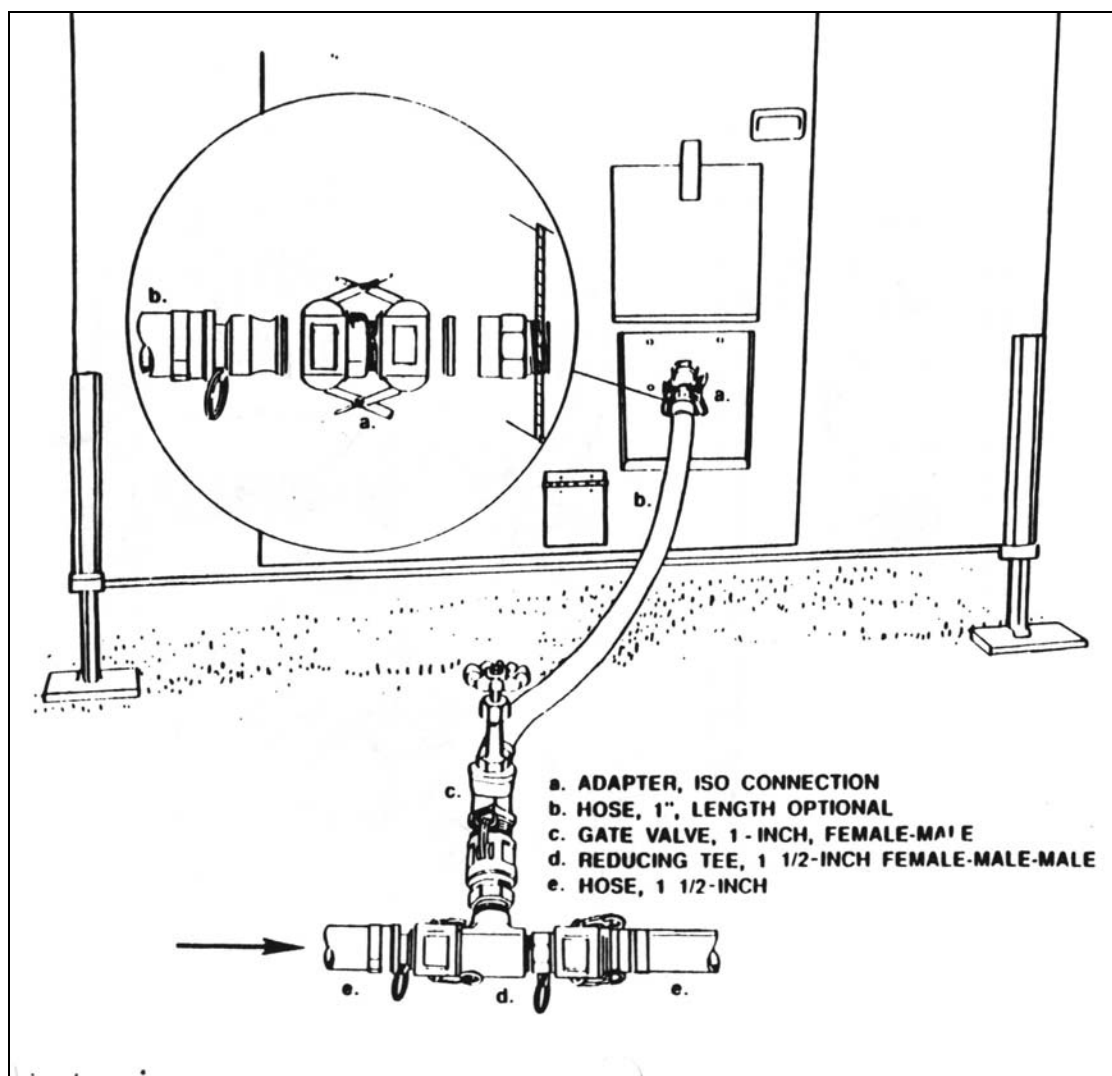


Figure 3-33
Connection to a Single Receptacle ISO (with hose)

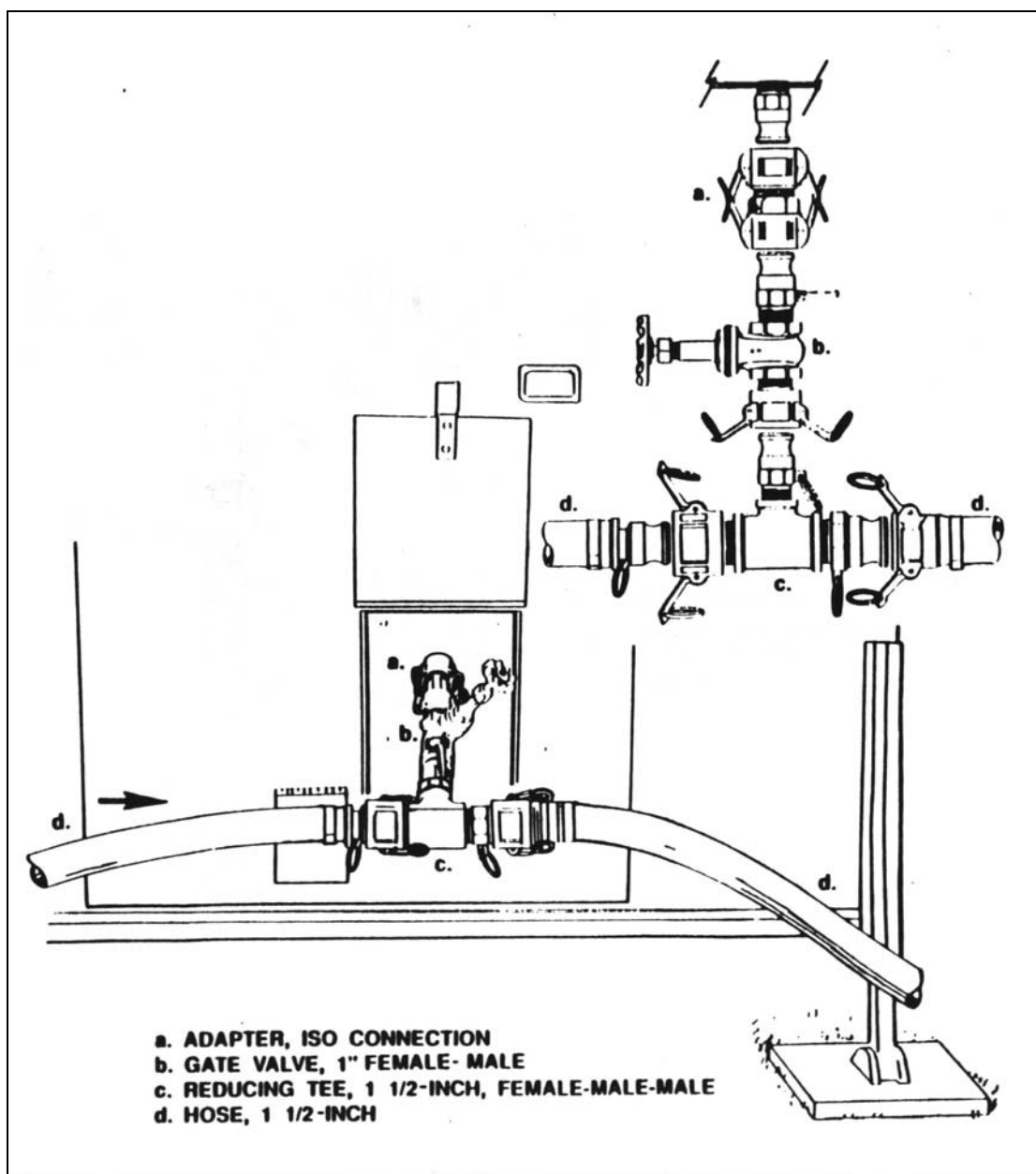


Figure 3-34
Connection to a Single Receptacle ISO (without hose)

k. Use the hose protection channels for hose that will cross TEMPER corridors. If conditions and time permit you may bury the hose and the channel protector, but it is not necessary. Run the hose under the edge of the tent flap and both layers of the floor. You may need to untie the floor

tie-downs. Place the protective channel over a hose connection.

l. With the system laid out prepare for the assembly. Correct assembly of the hoses and cam-lock fittings is easier if the fittings are clean. Dirty or mud-encrusted connections must be cleaned off prior to assembly. It

is absolutely essential to avoid contaminating the inside of the hoses and fittings. Follow the procedure below as closely as possible.

CAUTION
**Correct assembly of connections
is essential to avoid
contaminating the system.**

(1) Open the locking levers for both cam-lock connectors. **DO NOT REMOVE THE FEMALE DUST CAP OR MALE DUST PLUG.**

(2) Place the female connector on an elevated surface (such as the toe of your boot), that allows the opening of the fitting to be face up, or off the ground. This procedure, which applies to all connections, reduces the chance of contaminants entering the fitting.

(3) Lay the male fitting across the female fitting.

(4) Remove the dust plug from the female fitting.

(5) Holding the dust plug in your hand; remove the dust cap from the male fitting.

(6) Connect the dust plug and dust cap to each other. Close the locking levers and lay them on the ground.

(7) Connect the male and female hose connectors or valve fittings without allowing the fittings to touch the ground. Close the locking levers.

(8) If you find dirty connections during the assembly process, ensure that they are cleaned prior to assembly.

(9) Use this procedure to make

all the connections in the system. One exception is the connection at the ISO. The male fitting on the ISO does not have a dust cap. Because of this, the dust plug from the female-female adapter will not have a matching connection.

Final checks to be done **BEFORE TURNING ON THE WATER.**

(1) Open all gate valves in the primary and secondary loop(s), and to the nozzles and ISOs.

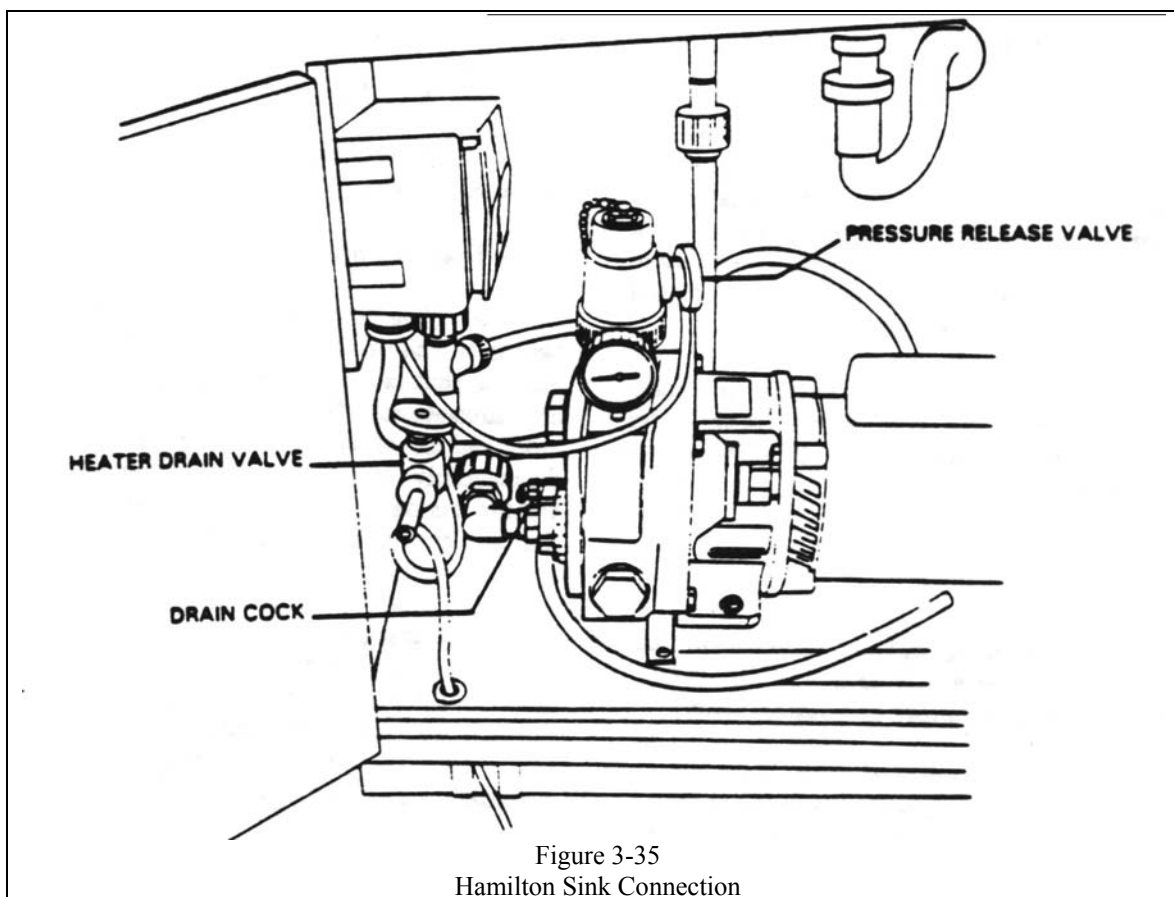
(2) Close all valves to the field sinks.

(3) Close the globe valves on the Interior wall panel of the ISO. Ensure the Hamilton sinks are ready by closing the:

(a) Drain cock on the pump.

(b) Valve at the top of the pump body.

(c) Heater drain valve.



(4) Make sure that the field sinks are ready. Instruct users of the field sinks connected to the system to set them up

for gravity operation in accordance with the manufacturer's literature.

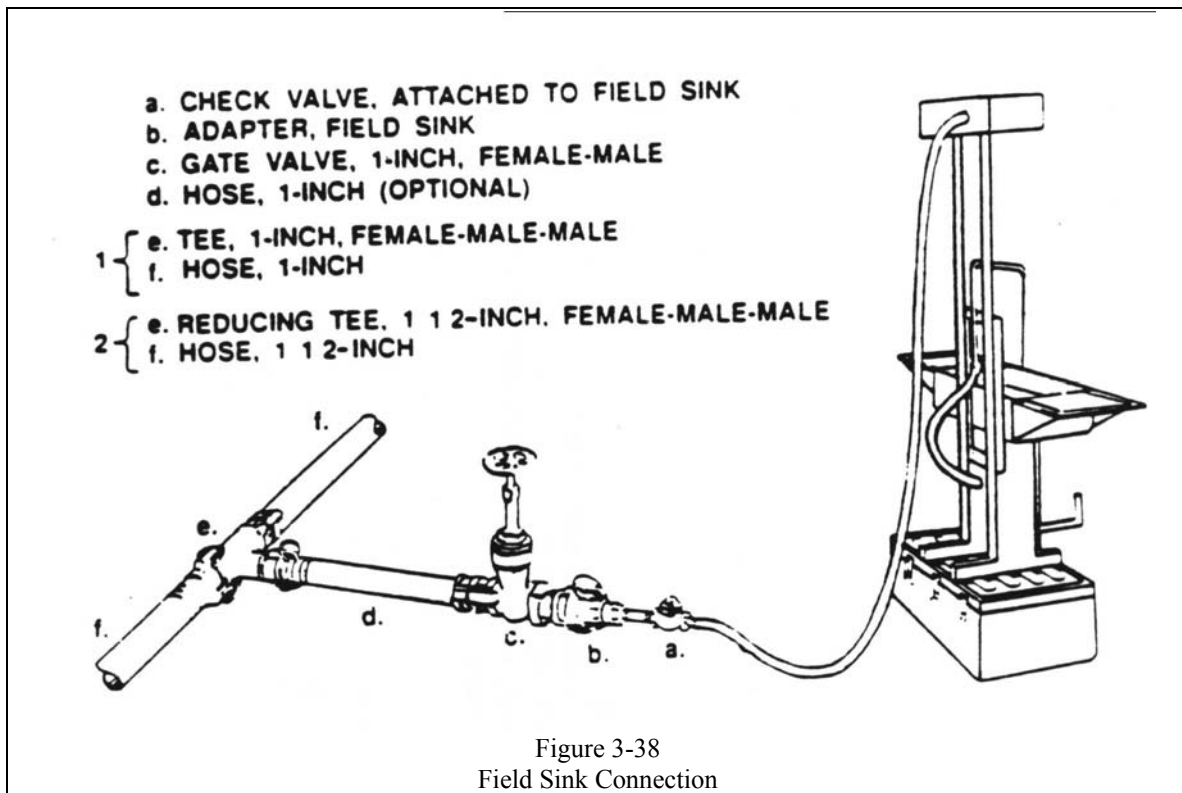


Figure 3-38
Field Sink Connection

(5) With water in the storage tank(s) and all of the connections made:

(a) Open the valve on the storage tank immediately before the pump.

(b) Remove the nut at the top of the pump assembly body. Refer to TM 5-4320-274-14&P. With a water tank full of water, the pump will prime itself. Removing the nut allows air to escape: water fills the pump body. Once water has reached the nut opening, replace the nut and tighten firmly.

(c) Open the gate valve at the return side of the water tank. If you are using more than one tank, open the valves between the tanks.

(d) Turn on the circuit for the pump.

(e) Turn on the circuit for the Hypochlorinator.

(f) Turn on the circuits for the in-line water heaters.

l. Adjust the rate of flow at the return side of the distribution system. Adjust the rate of flow with the gate valve so that the pressure gauge reads between 8 and 12 pounds per square inch (psi).

m. Adjust the flow at the secondary loop(s). The presence of water in the secondary loop(s) does not mean that water is flowing through the loop(s). To ensure water is flowing, gradually close the 1½ inch gate valve. Continue closing the valve until the flowmeter reads between 5 and 10 gallons per minute.

n. Return to the gate valve by the pressure gauge. After adjusting the flow for the secondary loop(s), the flow rate here may need to be adjusted. Use the gate valve to adjust the rate of flow until the pressure gauge reads between 8 and 12 psi.

o. Go to each Hamilton sink. Instruct the users to double-check that the sinks are ready. Have them open the globe valve on the ISO wall. Turn on the water. The initial water from the faucet may appear rusty. This is rust that was on the inside of the body of the pump in the Hamilton sink. Allow the water to run until the water clears.

p. Go to each field sink connected in the water distribution system. Instruct the users to open the gate valve, but not all the way. If there are any leaks anywhere but at the threaded fittings, defer the sink to maintenance. Users can correct leaks at the fittings by tightening them with a pair of pliers. It is up to the user to adjust the rate of flow to the sink with the gate valve.

q. Before the water is used, direct the field sanitation team to test the chlorine in the water storage tank(s). Then operate EVERY sink in the system for three to five minutes. Operate each nozzle for one minute. This flushes the system of potential contaminants that may have entered the hoses and fittings since last use.

r. Coordinate with preventive medicine personnel to inspect the system and take water samples. Coordinate also with regular preventive medicine for regular inspections and sampling.

3-5. Operation

The purpose of this paragraph is to ensure that the equipment is operated safely and that the system provides a continuous supply of potable water.

a. Monitor the water supply. Turn off the pump when the depth of water in the water tank is less than 8 inches. The bearings in the water pump will burn out if the pump impeller is not covered with water.

b. The field sanitation team should monitor the chlorine residual in the water supply. Measure chlorine residual at the water tank(s), and 20 percent of the sinks and nozzles in the distribution system daily. A chlorine residual is essential for preventing biological contamination. However, too high a chlorine residual will make the water taste bad.

c. Remove and clean the filter in the filter assembly daily. This requires shutting down the pump. In order to minimize downtime, have a clean filter ready for immediate installation. Follow the procedure below to change the filter.

(1) Turn off power to the heaters.

(2) Turn off power to the hypochlorinator.

(3) Turn off the power to the pumps.

(4) Close the gate valve by the filter assembly.

(5) Change filters in the filter assembly.

Water Distribution and Wastewater Management System (WDWWMS)

- (6) Open the gate valve.
- (7) Prime the pump.
- (8) Turn on the power to the pump.
- (9) Turn on power to the hypochlorinator.
- (10) Turn on power to the heaters.
- (11) Clean the old filter and place it in the storage container.

3-6. Disassembly.

a. The procedures discussed here will enable you to disassemble the system in a manner that is efficient and minimizes the chance of contamination. The procedure is intended to be independent of any other actions associated with the disassembly of the hospital. However, hose lines located inside a TEMPER must be removed before the tent can be disassembled.

b. Disconnecting the cam-lock fittings is **not** the first thing done in disassembly. However, it is the most frequent task and warrants being discussed first. This procedure is not the reverse of the assembly process previously discussed. The intent is the same though; disconnect with minimal risk of contaminating the system.

- (1) Unlock all four locking levers.
- (2) Separate the fittings. Rest the female fitting on a protective surface (**NOT ON THE GROUND**) with its

opening up. The toe of your boot will work.

(3) Lay the male fitting on the female fitting (or hose) in a way that prevents the male fitting from making contact with anything else.

(4) Separate the dust cap and dust plug. **DO NOT PLACE THEM ON THE GROUND.**

(5) Holding the dust plug, place the dust cap on the male fitting of the cam-lock.

(6) Place the dust plug in the female fitting of the cam-lock.

(7) Close all four locking levers.

c. Turn off the power to the heaters.

d. Turn off the power to the hypochlorinator.

e. Turn off the pump and close the valves on the water tank(s).

f. Determine the topographical low point in the water distribution system. At this point, disconnect a hose section and permit the water in the hose to drain by gravity. If there is not one clear topographical low point; disconnect the hose at several points to encourage gravity draining.

g. While the hoses are draining, drain the remaining water from the storage tank(s). The location of the tank(s) may not be well suited for emptying their contents in place. You may wish to connect one or more lengths of discharge hose and drain the tanks

away from the hospital. Use the pump to speed up the process. Set the pump up with suction hose, just as when laying the system out. Use as much hose as necessary to drain the tank(s) wherever you wish. **NOTE: Select a drainage location where the slope of the ground will not carry the water into the hospital area. NOTE: As the water storage tank empties, the water pump may become dry and subject to damage. Ensure that the water pump is in the water. Use caution to prevent the pump from running and burning up when the water level in the tank(s) falls below 6 inches.**

h. Once the tank(s) is empty, open the drain cock on the pump and let the pump body drain. Tip the pump up to remove any water remaining in the bottom of the pump body. Leave the drain cock open to allow the pump body to air-dry.

i. While the system is draining, disassemble the hose, starting at the water tank(s).

(1) Remove the gate valves and tee fittings before rolling hoses for storage. Reattach the dust caps and dust plugs to the fittings as you disconnect them. Place the fittings in the Cage, Wire, Folding.

CAUTION
To prevent contaminants from entering the system, reattach dust caps and dust plugs to fittings and hoses before storage.

(2) When rolling hoses, leave the far end of the hose open to allow any remaining water to drain. If possible,

keep that end off the ground. If this is not possible, rinse the end of the hose before attaching the dust cap or dust plug.

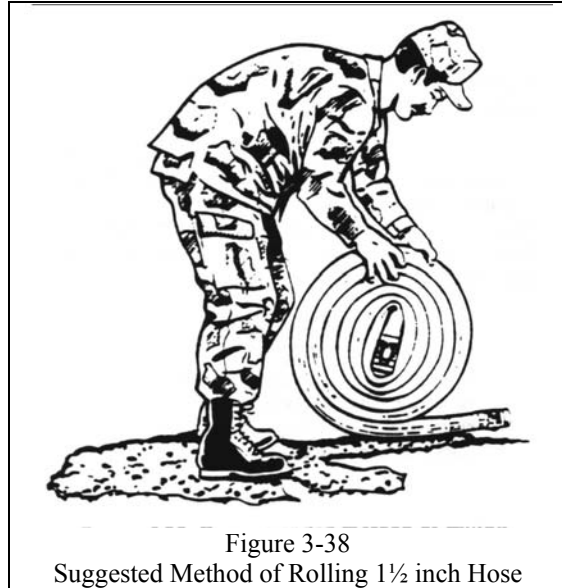


Figure 3-38
Suggested Method of Rolling 1½ inch Hose

(3) Several lengths of short hose can be rolled as one piece.

(4) 1-inch hose cannot be rolled in the same manner as 1½ inch hose. It must be fed into the cage and coiled in layers. Place one end of the hose against the inside wall and work toward the center of the cage.

j. Remove the hoses from the inside of the Tempers. The instructions here presume that the hose in the TEMPER is part of a secondary loop.

(1) Close all gate valves. This includes the valves to feeder lines, field sinks, and the valves at the beginning and end of the loop.

(2) Disconnect all feeder lines and field sinks from the secondary loop. Leave gate valves attached to the secondary loop.

(3) Disconnect the cam-lock connections immediately outside each end of the TEMPER. Lift one end of the hose and walk it through the TEMPER. Use caution as the fittings could rip the flooring.

CAUTION
Handle the hose inside the TEMPER with care. The fittings may damage the canvas or flooring.

k. As much as possible, store similar fittings together in the cage.

l. Prior to storing the flowmeters and pressure gauges open the caps and plugs on each item and drain the water. Shake any additional water from each item before replacing the caps and plugs. Store them in the Case, Electrical-Electronic Test (NSN: 6625-01-449-2857, PN: 13229E7189).

m. Advise users of the Hamilton sink to open the drain cock, pressure release valve, and heater drain valve. All of these components are inside the sink base and covered in more detail and discussed in the Hamilton sink operator's manual. These steps allow water to drain from the pump and the heater. This prevents the formation of rust and growth of bacteria.

3-7. Preventive Maintenance.

The following preventative checks and services should be done periodically during operation. They should also be done prior to storing the equipment following completion of a mission or field training exercise.

a. *Water Storage Tanks.* Operator, Maintenance, and PMCS are addressed in the applicable Technical Manuals

b. *Pump.* Operator, Maintenance and PMCS are addressed in TM 5-4320-274-14&P and Chapter 5 of this manual.

c. *Discharge Hose.* Check hoses for abrasions, cuts, and gouges. Check for –

- Presence of bulges or seepage during operations.
- Presence and condition of locking levers.
- Presence and condition of hose clamps.
- Presence of cap and plug attached by chain and key rings.
- Abrasions on cam-lock fittings.
- Presence and condition of gaskets inside the female fittings and caps.

d. *Suction Hose.* Perform the same checks for the discharge hose. The shape of the hose is maintained by steel coils and should be generally round. If the hose is deformed (normally caused by vehicle traffic), use a rubber or lead hammer to restore the cylinder shape of the hose.

e. *Fittings and Valves.* Check –

- For cracks in the body of the fitting or valve.
- For leakage at the threads
- For broken or bent handles on gate valves.

- To ensure that the nut at the top of the rising stem gate valve is secure.

f. *Gauges and Flowmeters.* In addition to functional checks during normal operations, check for –

- Cracked or broken glass.
- The presence of caps and plugs attached by chain and key rings.
- Presence and condition of gaskets inside the female fittings and caps.

3-8. Repair Procedures.

Part of the Water Distribution and Wastewater Management System (WDWWMS) is the WDWWMS Maintenance Set that includes an assortment of repair parts and critical tools to maintain the system. This set is fielded with the remainder of the system. It is the user's responsibility to replenish the components as needed.

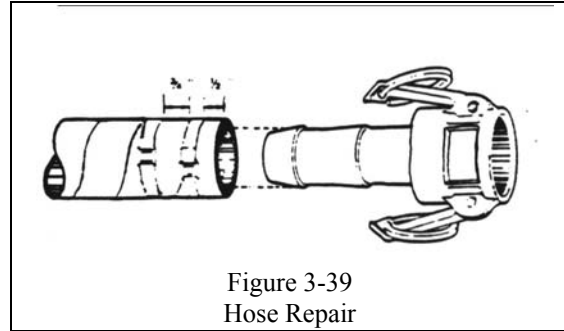
a. *Hose.* The repair procedures discussed here applies to both suction and discharge hoses.

(1) *Broken, torn, or punctured hose.* The principal behind repair services for a damaged hose is to make two good hose sections from one damaged one. Dispose of pieces of hose shorter than 2 feet.

(a) Use a hacksaw to cut the hose and remove the damaged portion.

(b) Place two hose clamps (from the maintenance set) over the newly cut end.

(c) Insert a hose coupling in the newly cut end, as far as it will go. The coupling must be the opposite gender of the cam-lock fitting on the other end of the hose.



(d) Position the hose clamps near the end of the fitting.

(e) Tighten the hose clamps and trim off the excess.

(f) Attach key rings, chain, and caps (or plugs).

(g) Repeat steps (b) through (f) for the other piece of hose.

b. *Fittings and Valves.* Replace missing or damaged caps, plugs, chains, and rings as needed. The complete fittings and valve assemblies are made up of individual parts that may be requisitioned separately. Should a fitting or valve become unserviceable, retain the serviceable parts for use in reassembling the fitting or valve. This can also be applied to the nozzle, flowmeters and pressure gauge.

Chapter 4

WATER DISTRIBUTION SET (WDS)

Medical Re-Engineering Initiative (MRI) 164 Bed Configuration

Operator, PMCS, and Repair Instructions

4-1. Introduction

a. This chapter describes the assembly, operation, and disassembly of the Water Distribution Set (WDS) (MF2K Configuration).

b. The main reason for having a pressurized water distribution system is to control infection and communicable diseases in the hospital. The WDS accomplishes this by starting with covered water storage tanks, pressurizes the water with electric pumps, adds chlorine as necessary, and routes the potable water through a distribution system to designated areas of the hospital.

c. It is necessary that you coordinate early with Preventive Medicine personnel to inspect, take samples from, and analyze the water distribution system. Advise hospital personnel that the water from the system cannot be considered potable until certified by Preventive Medicine personnel.

4-2. Components.

a. *Cam-Lock Connections.* With two exceptions every connection in the water distribution system is connected to similar hoses by use of cam-lock fittings. The exception connects are the field sink adapter and the ISO adapter. Both connections are discussed later in this chapter. Cam-lock is a quick disconnection system that requires no special training or tools. There are no

threads on the parts or hoses to be connected. To use cam-lock fittings, the dust cap or plug is removed from each hose end, then insert the male end fitting into the female end of the other fitting. Pull the levers back towards the hose to cam-lock the two parts together. There are some steps to be followed in making and breaking a hose connection. These steps are discussed later in this manual.

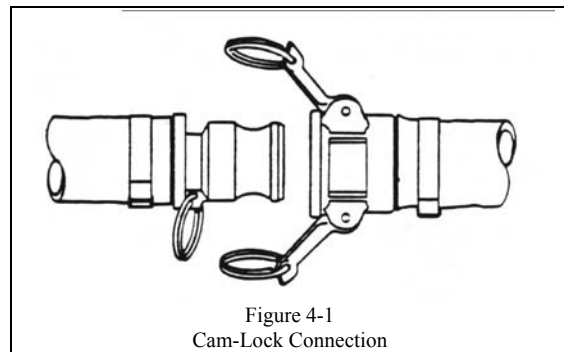


Figure 4-1
Cam-Lock Connection

Water Storage Tanks. Units are authorized the following types and quantities of water storage tanks.

- LIN T12938 – Tank Fabric, Collapsible, 20,000 Gallon Capacity (NSN 5430-01-406-0507)



Figure 4-2
Tank Fabric Collapsible, 20,000 Gallon
Laid Out on Ground

Water Distribution and Wastewater Management System (WDWWMS)

Requirements

	T12938
MRI 164 CSH	1

b. *Water Pump.* The water pump used in the WDS (Pump Unit, Centrifugal, 65 GPM [NSN 4320-01-440-4421]) has a 220 volt, 3-phase, totally enclosed, fan-cooled, electric motor. Each water pump is supplied with an integral power cord (40') that terminates in a male Class "L" power connector. The plug interfaces directly with the DEPMEDS electrical distribution system. Each pump is outfitted with a male and female, 1 1/2 inch cam-lock connection. There are two pumps in the WDS. One pump will serve the primary water distribution loop of the hospital, and the other is used to augment or maintain pressure through the secondary loops. For the MF2K configuration, a third pump is located in the Waste-Water Augmentation Set (WWAS). The third pump will be used in the event that a Hospital Unit Base (HUB) and a Hospital Unit Surgical (HUS) operate independently.

CAUTION
Two persons are required to lift or carry a water pump.

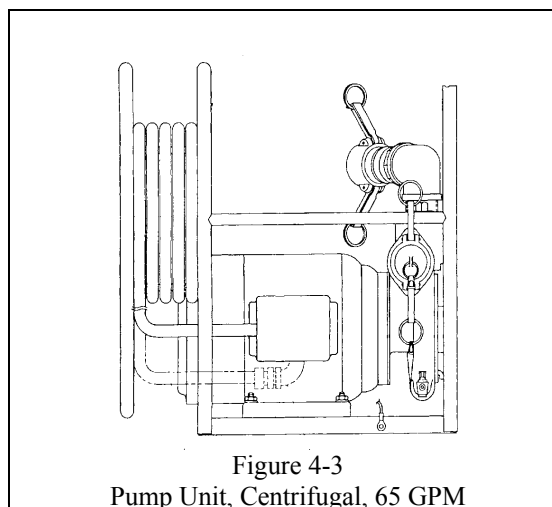


Figure 4-3
Pump Unit, Centrifugal, 65 GPM

c. *Hoses.* The hoses that are contained within the WDS are:

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8338)
PN: 13225E9136-14
5 feet in length, 1-inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-175-5958)
PN: 13225E9136-12
10 feet in length, 1-inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-177-3714)
PN: 13225E9136-13
20 feet in length, 1-inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8337)
PN: 13225E9136-15
50 feet in length, 1-inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8336)
PN: 13225E9136-17
5 feet in length, 1½ inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-7779)
PN: 13225E9135-9
10 feet in length, 1½ inch diameter

Water Distribution and Wastewater Management System (WDWWMS)

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8343)
PN: 13225E9136-9
10 feet in length, 1½ inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8341)
PN: 13225E9136-10
20 feet in length, 1½ inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8335)
PN: 13225E9136-18
50 feet in length, 1½ inch diameter

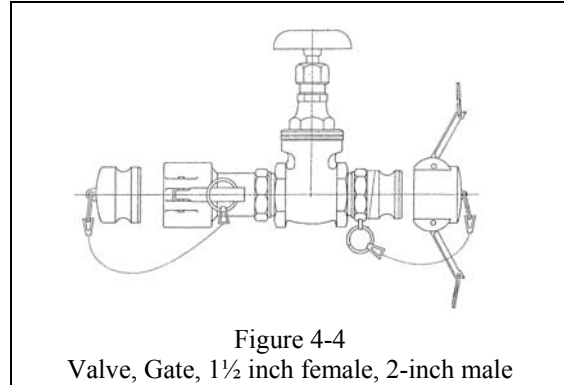
Hose Assembly, Nonmetallic
(NSN: 4720-01-140-6288)
PN: 13225E9136-4
20 feet in length, 4-inch diameter

d. *Fittings and Valves.* There are numerous fittings and valves within the WDS. With two exceptions every fitting in the set has cam-lock connections.

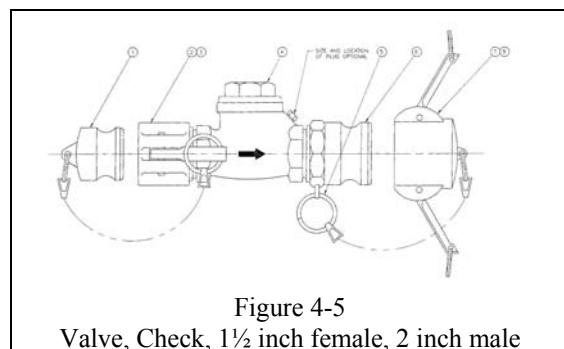
(1) Reducer, 4-inch female, 2-inch male (NSN: 4730-01-064-0560) (PN: AA59326XI-1-9). This reducer is used on the supply side of the Tank, Fabric, Collapsible 20,000 Gallon. It is connected to the end of one of the Hose Assembly, Nonmetallic (NSN: 4720-01-140-6288) PN: 13225E9136-4. **NOTE: Some valves and fitting descriptions are identified with the letter F for female and M for male connections.**

(2) Reducer, 4-inch male, 2-inch female (NSN: 4730-01-186-0821) (PN: AA59326XI-1-10). This reducer is used on the return side of the Tank, Fabric, Collapsible 20,000 Gallon. It is connected to one of the Hose Assembly, Nonmetallic (NSN: 4720-01-140-6288) PN: 13225E9136-4.

(3) Valve, Gate, 2 inch female, 1 ½ inch male (NSN 4820-01-440-8306) (PN: 13229E7178). This valve is attached to the male cam-lock of the Reducer, 4" F x 2" M (NSN: 4730-01-064-0560, PN: AA59326XI-1-9) which will be used on the Tank Assembly, Fabric Collapsible (20,000 gallon) (LIN: T12938, NSN: 5430-01-406-0507).



(4) Valve, Check, 1½ inch female, 2-inch male (NSN: 4820-01-440-5919, PN: 13229E7197). This valve is attached to the female cam-lock of the Reducer, 4-inch male, 2-inch female (NSN: 4730-01-186-0821) (PN: AA59326XI-1-10) which will be used on the Tank Assembly, Fabric Collapsible (20,000 gallon) (LIN: T12938, NSN: 5430-01-406-0507).



Water Distribution and Wastewater Management System (WDWMS)

(5) Valve, Globe, 1½ inch female, 1½ inch male (NSN: 4820-01-440-8765, PN: 13229E7169). This valve is attached to the 1½ inch loop, immediately after the beginning of a 1-inch loop. It is also used when multiple water tanks are arranged in parallel. In this application, the valve is manually adjusted to control the rate of flow in the system.

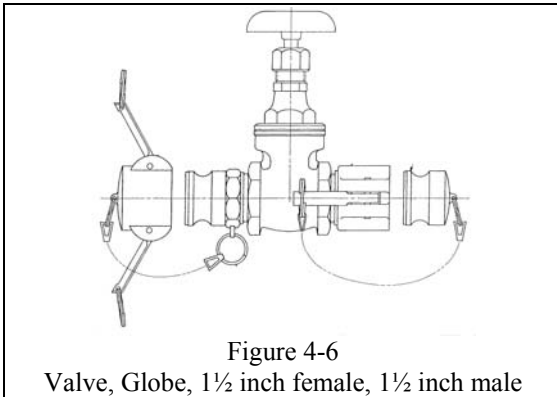


Figure 4-6

Valve, Globe, 1½ inch female, 1½ inch male

(6) Valve, Gate, 1 inch female, 1 inch male (NSN: 4820-01-440-7798, PN: 13229E7167). When used with individual water users, such as field sinks and nozzles, this valve controls the rate of flow. It is also used at the beginning of secondary loops and long one-way water lines. Used this way, repairs or changes in the secondary loops can be made without interrupting water supply to the rest of the hospital.

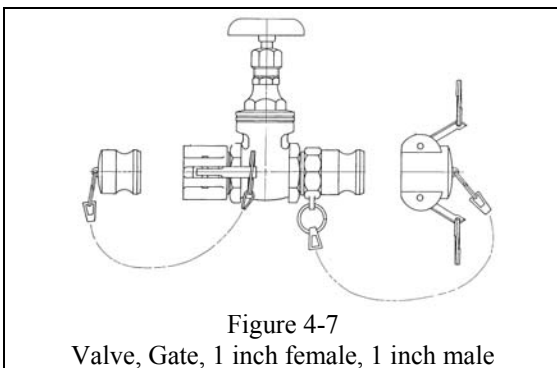


Figure 4-7

Valve, Gate, 1 inch female, 1 inch male

(7) Tee Assembly, Quick Disconnect, 1½" female x 1½" male x 1-inch male (NSN: 4730-01-440-4609, PN: 13229E7172). This fitting is used at each place where the one-way feeder lines branch off to the individual users, such as CMS, pharmacy, X-Ray, laboratory, etc. It is also used at the beginning and end of the secondary loop.

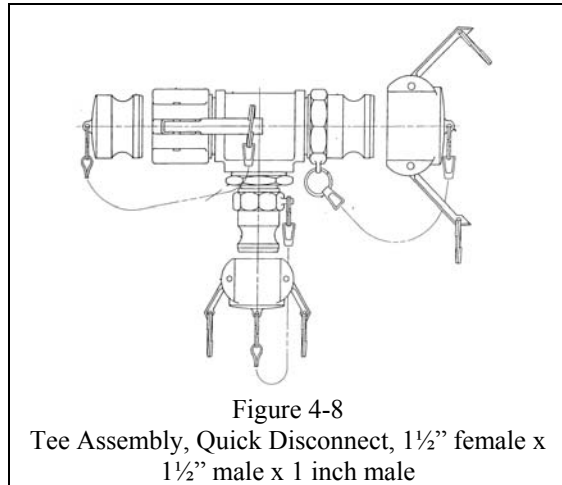


Figure 4-8

Tee Assembly, Quick Disconnect, 1½" female x 1½" male x 1 inch male

(8) Tee Assembly, Quick Disconnect, 1-inch female, 1-inch male, 1-inch male (NSN: 4730-01-440-4091, PN: 13229E0361). This fitting allows connection of the individual users along secondary loops or long one-way lines.

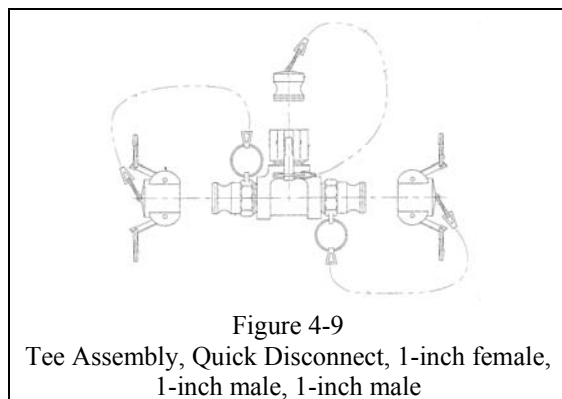


Figure 4-9

Tee Assembly, Quick Disconnect, 1-inch female, 1-inch male, 1-inch male

Water Distribution and Wastewater Management System (WDWMS)

(9) Tee Assembly, Quick Disconnect, 1½ inch male, 1½ inch male, 1½ inch female (NSN: 4730-01-440-4633, PN: 13229E7182)(see figure A-10). This fitting is used on the return side of the primary loop.

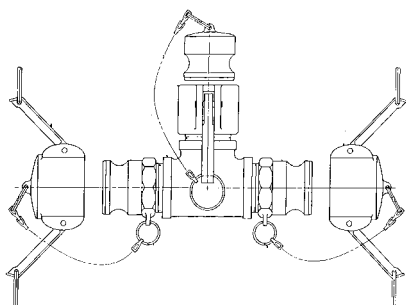


Figure 4-10

Tee Assembly, Quick Disconnect, 1½ inch male, 1½ inch male, 1½ inch female

(10) Tee Assembly, Quick Disconnect, 1½ inch female, 1½ inch female, 1½ inch male (NSN: 4730-01-440-4615, PN: 13229E7181). This fitting is located between the Tank Assembly, Fabric Collapsible (3,000 Gallon) (LIN: T19033, NSN: 5430-01-170-6984) and the Pump Unit, Centrifugal, 65 GPM [NSN 4320-01-440-4421] when two or more Tank Assembly, Fabric Collapsible (3,000 Gallon) are employed in parallel.

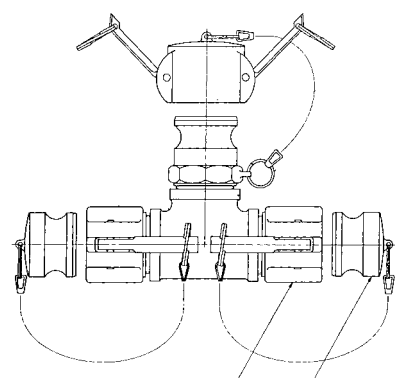


Figure 4-11

Tee Assembly, Quick Disconnect, 1½ inch female, 1½ inch female, 1½ inch male

(11) Tee Assembly, Quick Disconnect, 1½ inch female x 1½ inch male x 1-inch male (NSN: 4730-01-440-4613, PN: 13229E7174).

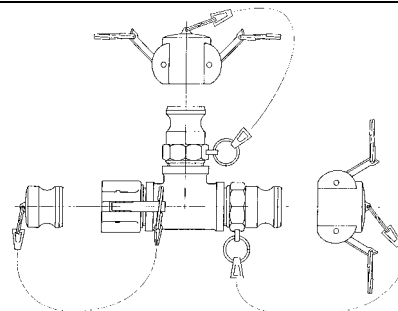


Figure 4-12

Tee Assembly, Quick Disconnect, 1½ inch female x 1½ inch male x 1-inch male

(12) Tee Assembly, Quick Disconnect, 1½ inch female, 1½ inch male x ¼ inch male (NSN: 4730-01-487-3575) is used to connect the Hypochlorination Unit (NSN: 4610-01-435-4884) (PN: WAL-1031-96) to the primary loop.



Figure 4-13

Tee Assembly, Quick Disconnect, 1½ inch female, 1½ inch male x ¼ inch male

(13) Coupling Assembly, Quick Disconnect, 1-inch female x 1-inch female (NSN: 4730-01-440-8569, PN: 13229E7173). This coupler is commonly referred to as a “Gender Changer”. It is used when a male outlet is connected to a second male connection and as a connection on the Hamilton Sink connections for the ISO containers.

Water Distribution and Wastewater Management System (WDWMS)

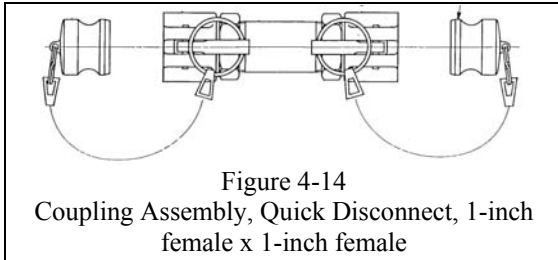


Figure 4-14
Coupling Assembly, Quick Disconnect, 1-inch
female x 1-inch female

(14) Plug, Quick Disconnect (NSN: 4730-01-415-6403, PN: 13229E7170). This fitting is used in conjunction with Adapter, Straight Hose to Boss (NSN: 4730-01-415-6420, PN: 13229E7195) to connect field sinks to the water loop.

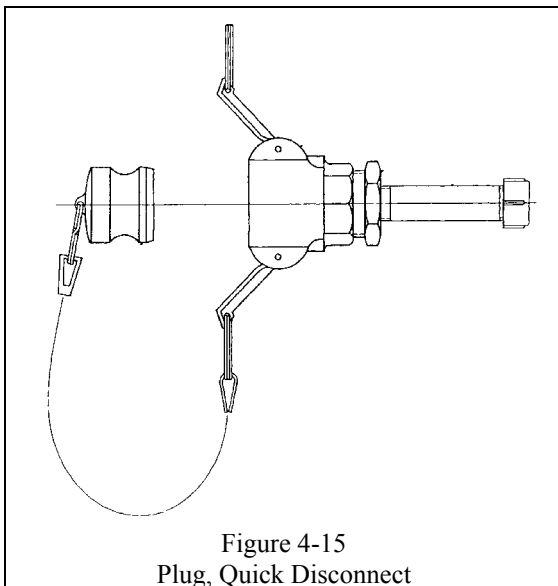


Figure 4-15
Plug, Quick Disconnect

(15) Adapter, Straight Hose to Boss (NSN: 4730-01-415-6420, PN: 13229E7195). This fitting is used in conjunction with Plug, Quick Disconnect (NSN: 4730-01-415-6403, PN: 13229E7170) to connect field sinks to the water loop. This is the first example where both connections are not cam-lock.

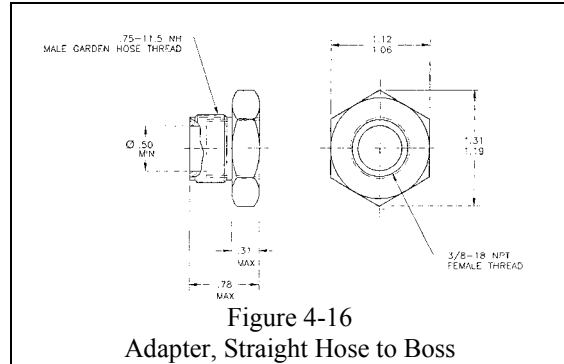


Figure 4-16
Adapter, Straight Hose to Boss

(16) Reducer Quick Disconnect, 1" F, 1/2" M (NSN: 4730-01-499-8752) (PN: 3629). This fitting is used to connect the Heater, Water, 9,000 Watts (NSN: 4520-01-493-7423) (PN: 111739) to the secondary potable water distribution lines.

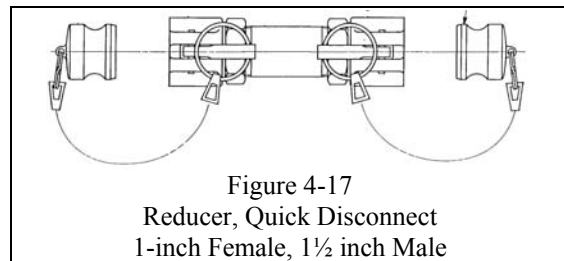


Figure 4-17
Reducer, Quick Disconnect
1-inch Female, 1/2 inch Male

(17) Reducer Quick Disconnect, 1/2" F, 1" M (NSN: 4730-01-499-8787) (PN: 3630). This fitting is used to connect the Heater, Water, 9,000 Watts (NSN: 4520-01-493-7423) (PN: 111739) to the secondary potable water distribution lines.

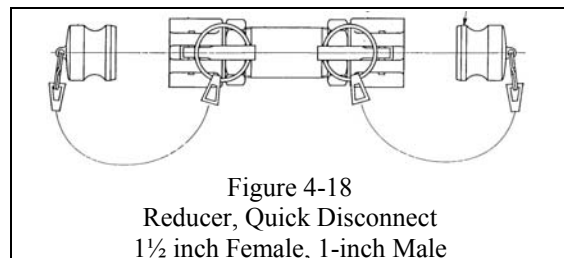


Figure 4-18
Reducer, Quick Disconnect
1/2 inch Female, 1-inch Male

e. Other Components

(1) Pipe Assembly, Potable Water (NSN: 4610-01-440-4086, PN: 13229E7162). This component measures the water pressure in the distribution system. This gauge is generally placed at the return end of the main loop. Its precise location depends on how the tanks are employed. **THE PRESSURE GAUGE IS FRAGILE.** When not in use, store it in the Case Electrical-Electronic Test (NSN: 6625-01-449-2857, PN: 13229E7189).

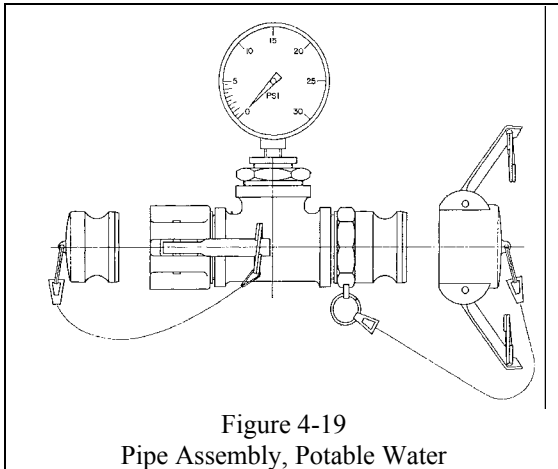


Figure 4-19
Pipe Assembly, Potable Water

(2) Pipe Assembly, Potable Water (NSN: 4610-01-440-4088, PN: 13229E7165). The water distribution system uses a flow meter that measures flow rates up to 100 GPM. It is placed at the end of the primary loop, immediately before the pressure gauge. **FLOW METERS ARE FRAGILE.** When not in use, store them in the Case Electrical-Electronic Test (NSN: 6625-01-449-2857, PN: 13229E7189).

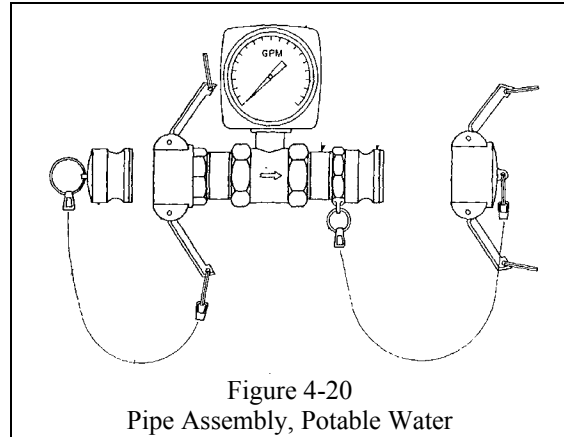


Figure 4-20
Pipe Assembly, Potable Water

(3) Indicator Assembly (NSN: 4610-01-440-4090, PN: 13229E7163). This assembly is used to monitor water flow through the distribution system. **THIS ASSEMBLY IS FRAGILE.** When not in use, store it in the Case Electrical-Electronic Test (NSN: 6625-01-449-2857, PN: 13229E7189).

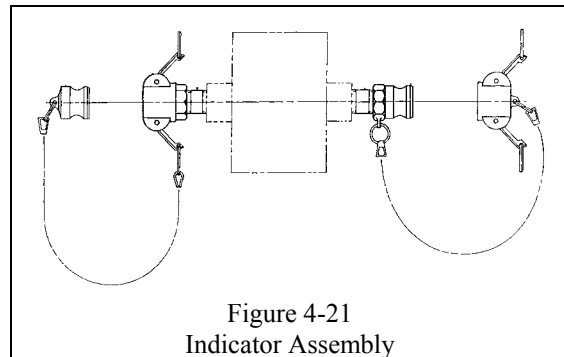
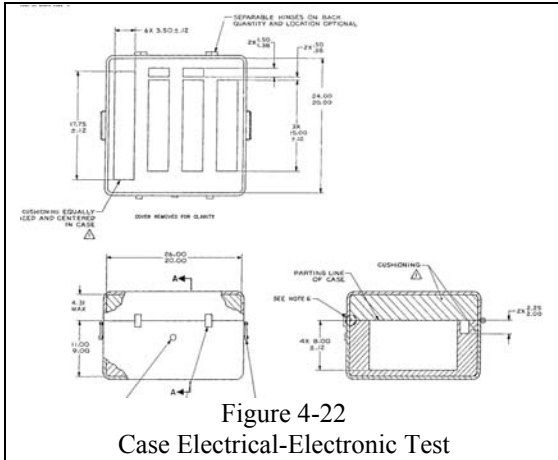


Figure 4-21
Indicator Assembly

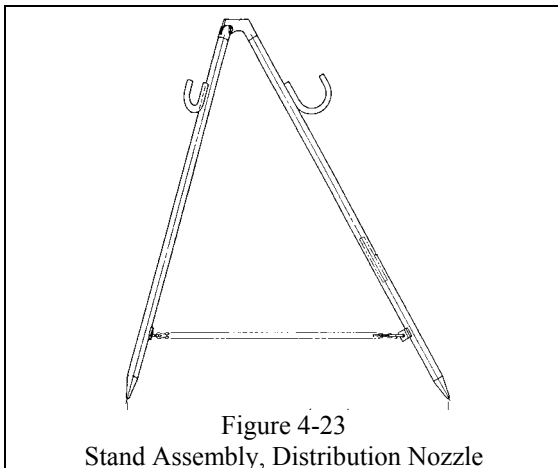
(4) Case Electrical-Electronic Test (NSN: 6625-01-449-2857, PN: 13229E7189). This case is used to store the pressure gauges, flow meters, indicator assembly and color comparator.

Water Distribution and Wastewater Management System (WDWMS)



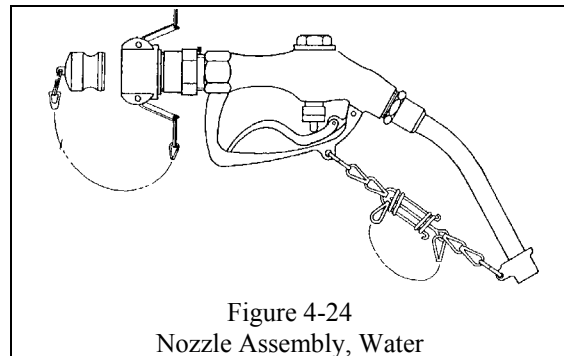
(5) Comparator, Color (NSN: 6630-01-044-0334, PN: U25377). The comparator is used by the equipment operator to visually determine the turbidity of the supplied water.

(6) Stand Assembly, Distribution Nozzle (NSN: 4930-01-120-7426, PN: 13225E9140). This assembly is used to suspend the Nozzle Assembly, Water (NSN: 4610-01-440-8834, PN: 13229E7168).

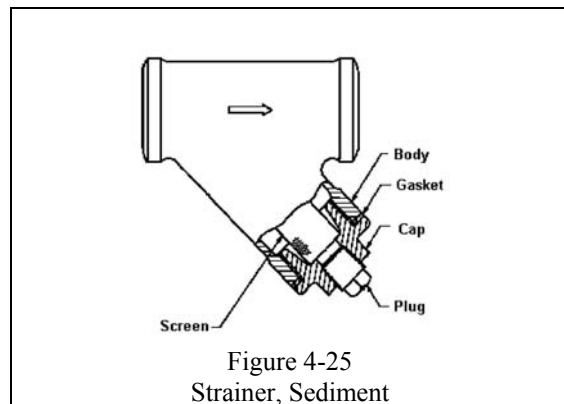


(7) Nozzle Assembly, Water (NSN: 4610-01-440-6834, PN: 13229E7168). The nozzle is provided to supply water to those parts of the hospital that are not connected to the water distribution system. Other uses

for this nozzle are outlined in the principles of installation section of this chapter.



(8) Strainer, Sediment (NSN: 4730-01-440-7662, PN: 13229E7179). This fitting is used to strain or remove large particles that could damage the water pumps in the water distribution system.



(9) Cage, Wire, Folding. This cage is used for the storage of fittings and hoses within the water distribution set.

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Figure 4-26
Storage and Retrieval Material System

(9) Pump Unit, Centrifugal (NSN: 4320-01-440-4421, PN: 13229E7159). The water pumps are supplied with the water distribution set. The water pumps are outfitted with quick-disconnect (cam-lock) fittings, and are rated at producing a 65 GPM water flow.

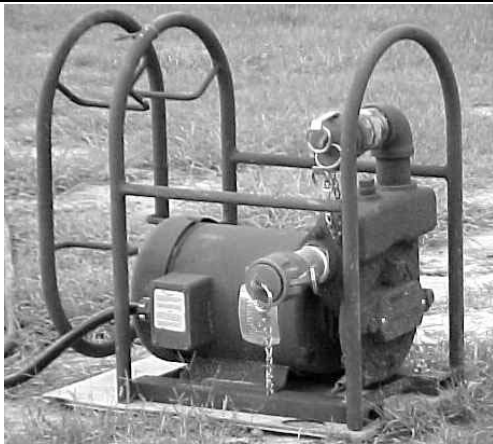


Figure 4-27
Pump Unit, Centrifugal

(10) Hypochlorination Unit (NSN: 4610-01-435-4884, PN: WAL 1031-96). This item is designed to treat and chlorinate the water within the water distribution system. The addition of chlorine based material to the water supply helps retard bacterial and fungal

growth within the hoses. It is also designed to provide the capability to flush (hyper-chlorinate) the water lines.



Figure 4-28
Hypochlorination Unit

(11) Can, Water, Military (NSN: 7240-00-089-3827, PN: MIL-C-43613). This water can is provided for mixing the Sodium hypochlorite (NaOCl) for the Hypochlorination Unit.

(12) Heater, Water, 9,000 Watts (PN: PWH). The, in-line water heater is provided for use of the system during cold weather operations. The heater is not intended to provide “hot” water, but raises the ambient temperature of the water in the hose lines by a few degrees to prevent freezing.



Figure 4-29
Heater, Water, 9,000 Watts

2-3 Principles of Installation

The water distribution set is intended to be as flexible in its layout as the DEPMEDS Combat Support Hospital itself. **THERE IS NO ONE “CORRECT WAY” TO SET UP THE WATER DISTRIBUTION SET.** The number of possible working configurations is almost unlimited. The information within this section provides the basic guidelines necessary for planning the layout for your hospital. Like other large footprint systems, the layout of the WDS must be planned in advance. Obtain a copy of the hospital layout as soon as possible, to determine the best locations (to ensure access to refill the tank(s)) for the major component, the water storage tank(s).

a. Location of Tank(s), Fabric Collapsible. Setting the tank(s) fabric, collapsible is the most important decision in setting up the water distribution set. There are a number of factors to consider.

(1) *Traffic Flow.* Trucks delivering water need access to the tank(s).

(2) *Electric Power.* The Pump Assembly, Centrifugal (NSN: 4320-01-440-4421), the Hypochlorination Unit (NSN: 4610-01-435-4884) and two Heaters, Water, 9,000 Watts (NSN 4520-01-493-7423) are placed near the tank(s) and they need electric power. The electric cables for pump assembly and heaters are 40 feet long.

(3) *Proximity of the Primary Loop.* The water distribution set is designed for the primary loop to be near the highest concentration of ISOs.

(4) *Sufficient Area.* The water distribution set comes with one Tank, Fabric Collapsible, 20,000 gallon. Each of these tanks is 27.2 feet long and 27.2 feet wide.

c. Location of the Primary Loop. The ISOs make up the largest number of water users in the hospital. As such, they use a large amount of water. For this reason, the primary loop should make its circuit around the highest concentration of ISOs. This approach also has the advantage of reducing the length of the primary loop, as well as reducing the amount of hose needed to connect the ISOs. The length of the primary loop is dictated by the number of hospital components being used, and their configuration.

d. Secondary Loop(s) Secondary loops are normally installed instead of long one-way water lines. Water constantly moves in the secondary loops. This greatly reduces the amount of stagnant water, and the potential of bacterial and fungal growth. Flowing water stays cooler longer in summer, and resists freezing in winter.

e. Water Distribution Nozzles. The Nozzle Assemblies, Water, (NSN: 4610-01-440-6834) have several applications in the DEPMEDS, Combat Support Hospital.

(1) An important application of the nozzle assembly is to supply water to those areas of the hospital that are not connected to the water distribution set.

(2) The nozzle assembly is an efficient way of filling the autoclaves. Locate a nozzle, with Stand Assembly, Distribution Nozzle (NSN: 4930-01-120-7426) in the vicinity of the Central Materiel Supply (CMS) TEMPER. The hand valve of the nozzle is not very sensitive to small adjustments and tends to give large quantities of water. For this reason you should install a 1 inch female-male Valve, Gate (NSN: 4820-01-440-7798, PN: 13229E7167) in the line leading to the nozzle assembly. Set the gate valve volume to reduce or adjust the flow of the water at the nozzle assembly. Adding this control feature should be at any location where excessive water is a potential problem. Locate the valve 20 feet or so away from the nozzle assembly to enable you to adjust overall flow without moving the valve.

f. Pedestrian and Vehicle Routes. Hoses should not cross vehicle routes. Hoses in pedestrian paths should be kept to a minimum. If a hose must cross a TEMPER, do so in a corridor, and use a Channel, Hose Protector (NSN: 4720-01-440-4925 PN: 13229E7176 or NSN: 4720-01-440-4928 PN: 13229E7175) (Both of these types of channel protectors are contained in the Waste-Water Augmentation Set, Hospital, MF2K.

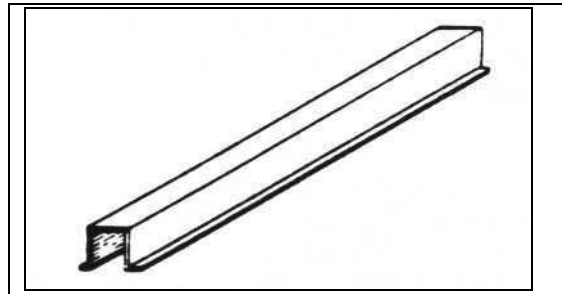


Figure 4-30
Channel, Hose Protector
NSN: 4720-01-440-4925

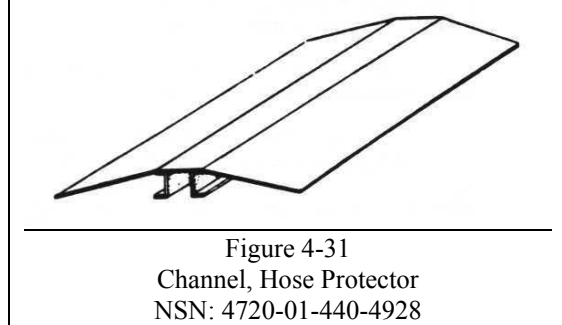


Figure 4-31
Channel, Hose Protector
NSN: 4720-01-440-4928

g. Location of In-Line Water Heaters. The in-line water heaters, supplied with this set are designed to keep the ambient temperature of the water within the hoses and bladders above freezing. The system is designed to have 4 heaters per primary loop, and 4 heaters per secondary loop. They come with cam-lock, quick disconnect fittings, and can be placed at various locations along the loop run. When planning on your setup, remember that these heaters require 208 Volts, AC electrical power and consequently must be located within 40 feet of a power distribution center (PDC). Also, the heaters should be placed as equally as possible along each loop.

2-4. Assembly. This section provides general guidance and some hard rules on how to assemble the water distribution set. Prior to assembly of the WDS, you should determine the layout of the water distribution set based on the information

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of previous paragraphs, and the Commander's desired hospital layout. It is helpful to sketch the layout of the water distribution set over the layout diagram of the hospital.

a. Assemble the tank(s) fabric, collapsible, 20,000 Gallon. Locate them using the information in paragraph 2-3a.

(1) Attach one Hose Assembly, Nonmetallic [4" x 20 feet] (NSN: 4720-01-140-6288) to the outlet port of the tank and one Hose Assembly, Nonmetallic [4" x 20 feet] (NSN: 4720-01-140-6288) to the inlet port of the tank.

(2) Attach the Reducer, Quick Disconnect [4-inch female x 2-inch male] (NSN: 4730-01-064-0560) to the Hose Assembly, Nonmetallic [4" x 20 feet] (NSN: 4720-01-140-6288) on the outlet port of the tank

(3) Attach the Reducer, Quick Disconnect [4-inch male x 2-inch female] (NSN: 4730-01-186-0821) to the Hose Assembly, Nonmetallic [4" x 20 feet] (NSN: 4720-01-140-6288) on the inlet port of the tank

(4) Attach the Valve, Gate [2-inch female x 1½ inch male] (NSN: 4820-01-440-8306) to the Reducer, Quick Disconnect [4-inch female x 2-inch male] (NSN: 4730-01-064-0560) on the outlet port of the tank. **(MAKE SURE THE VALVE IS TURNED OFF.)**

(5) Attach the Valve, Gate [1½ inch female x 2-inch male] (NSN: 4820-01-440-8302) Reducer, Quick Disconnect [4-inch male x 2-inch female] (NSN: 4730-01-186-0821) on

the inlet port of the tank. **(MAKE SURE THE VALVE IS TURNED OFF.)**

b. Attach the filter assembly. The location of the filter assembly depends on the configuration of the tanks. But, it should be located between the outlet port of the tank and the Pump Assembly, Centrifugal.

c. Connect the suction hose (1½ inch x 10 feet) between the pump and the assembly for the outlet port of the tank and the pump.

d. Select open 40-60 Ampere female connections on the power distribution panel (PDC). **MAKE SURE THE CIRCUIT BREAKER ON THE PDC IS OFF.** Connect the water pump's and the heaters' electrical plugs to the selected receptacles on the PDC.

NOTE

Do not power any pump until the water system is connected.

NOTE

Do not turn on the heaters until the water system is connected, and water is being pumped.

e. Lay the primary loop following the guidance in paragraph 4-3c. **DO NOT CONNECT ANY HOSES AT THIS TIME. DO NOT REMOVE THE CAPS OR PLUGS.** Be aware of the requirement of fittings near the ISO Container walls that have water receptacles. Connections between hoses in the primary loop should occur near these points. Also be aware of other requirements for breaks in the loop, such as secondary loops, feeder

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lines to individual users, nozzles to CMS, and inclusion of the Heater, Water, 9,000 Watts at various points in the primary and secondary loop(s).

f. Lay the 1 inch hose for the feeder lines between the main loop and the ISOs. This process more clearly defines the needs for breaks in the primary loop and for fittings. The CMS ISO has two water receptacles. All other ISOs have one water receptacle (except for OR, which has none) Place a 1 inch gate valve (NSN: 4820-01-440-7798) next to the tee assembly (NSN: 4730-01-440-4609). Placing the valve here enables you to disconnect an individual ISO without disrupting water supply to the rest of the hospital.

g. Lay the fittings and hose for

the secondary loop(s). The beginning of each secondary loop of each secondary loop is configured

h. The return side of each secondary loop is configured like that shown in Figure

i. Lay the necessary fittings and hose to connect the field sinks.

j. Lay hose lines to the nozzle locations. Place one nozzle next to each CMS tent. These hose lines need enough slack so that the nozzle can reach each autoclave. Place the 1-inch gate valve far enough away from the nozzle so that when the nozzle and hose are moved, the gate valve is not dragged.

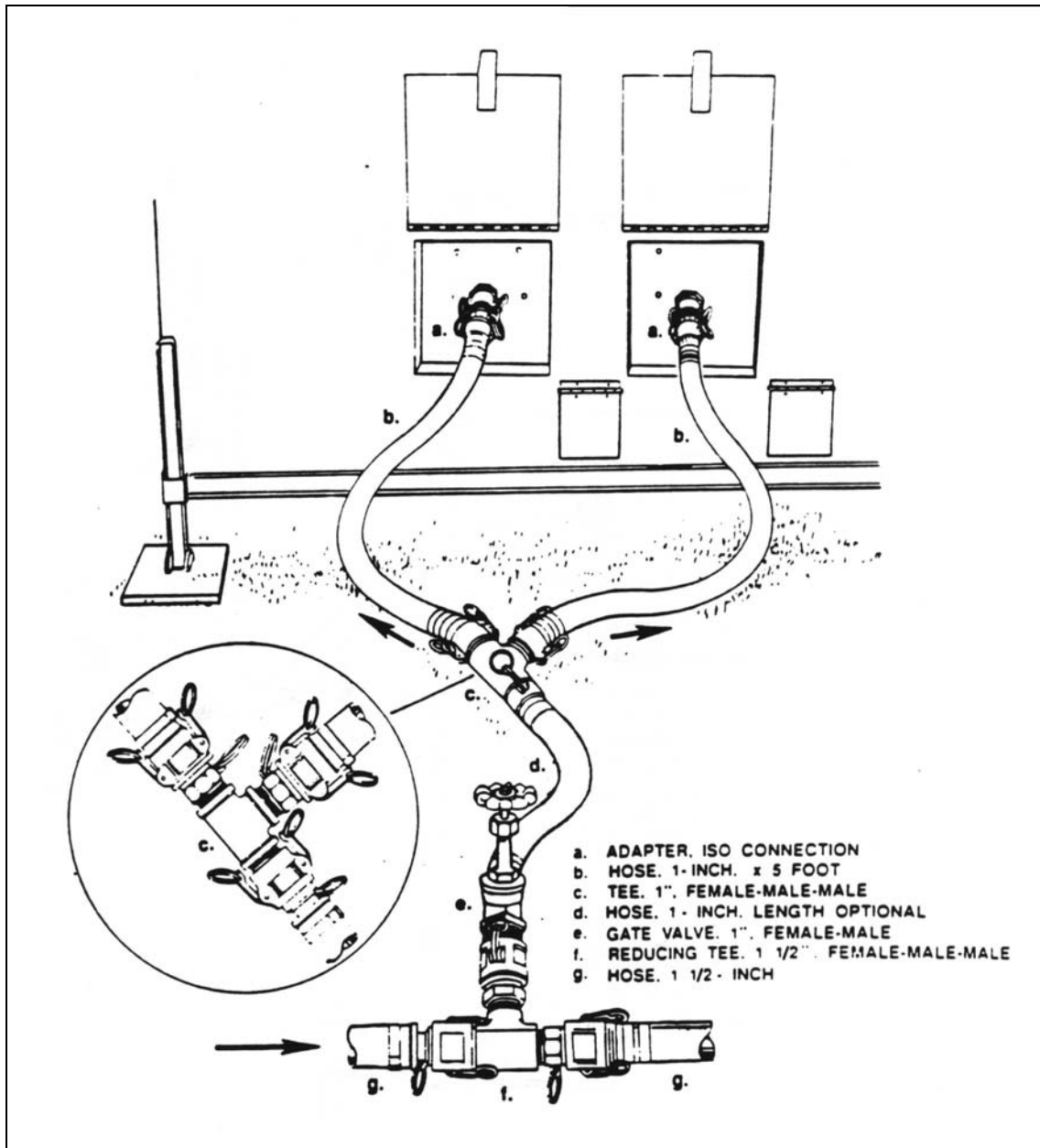


Figure 4-32
Water Hose Connection to the CMS ISO

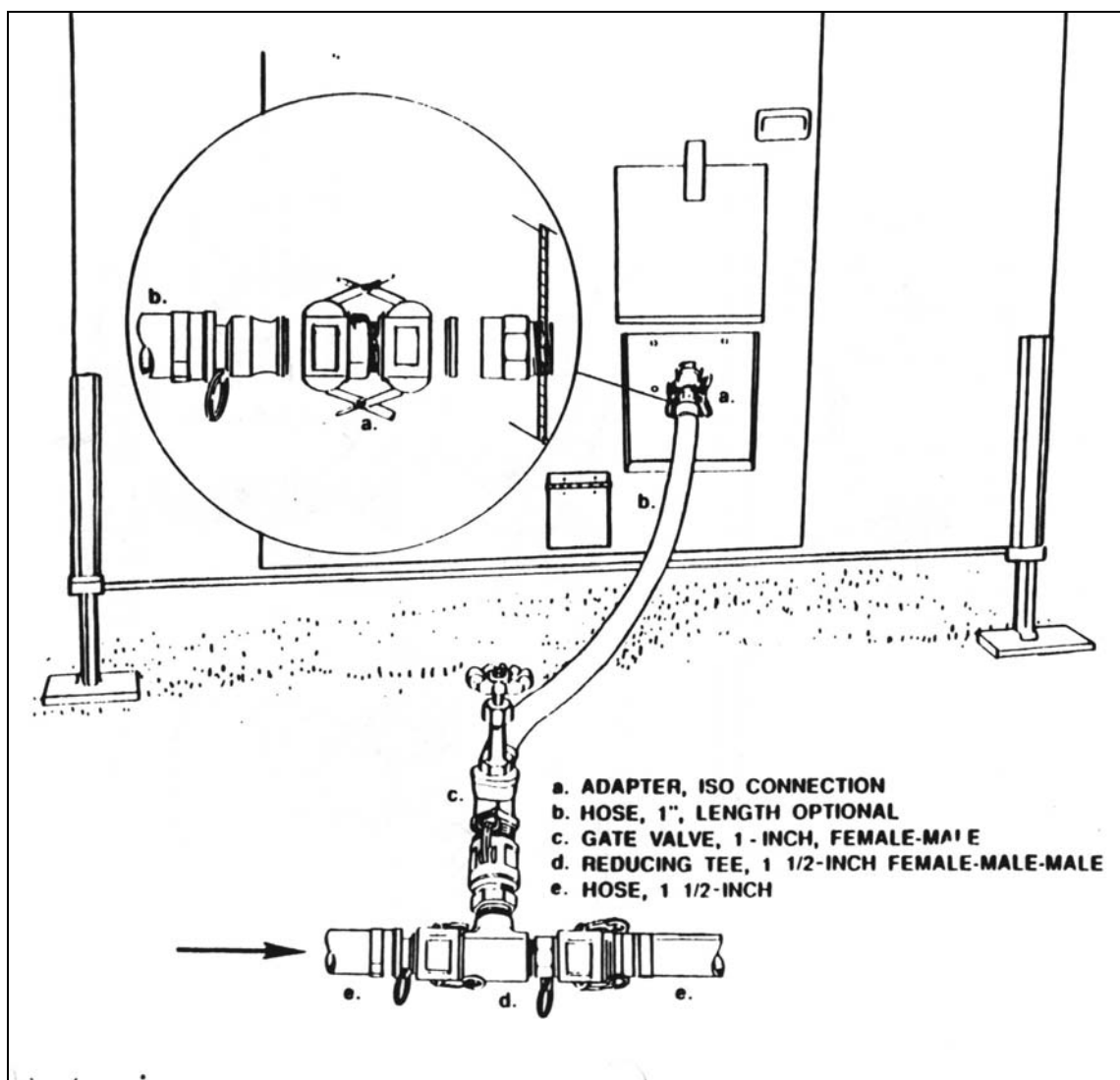


Figure 4-33
Connection to a Single Receptacle ISO (with hose)

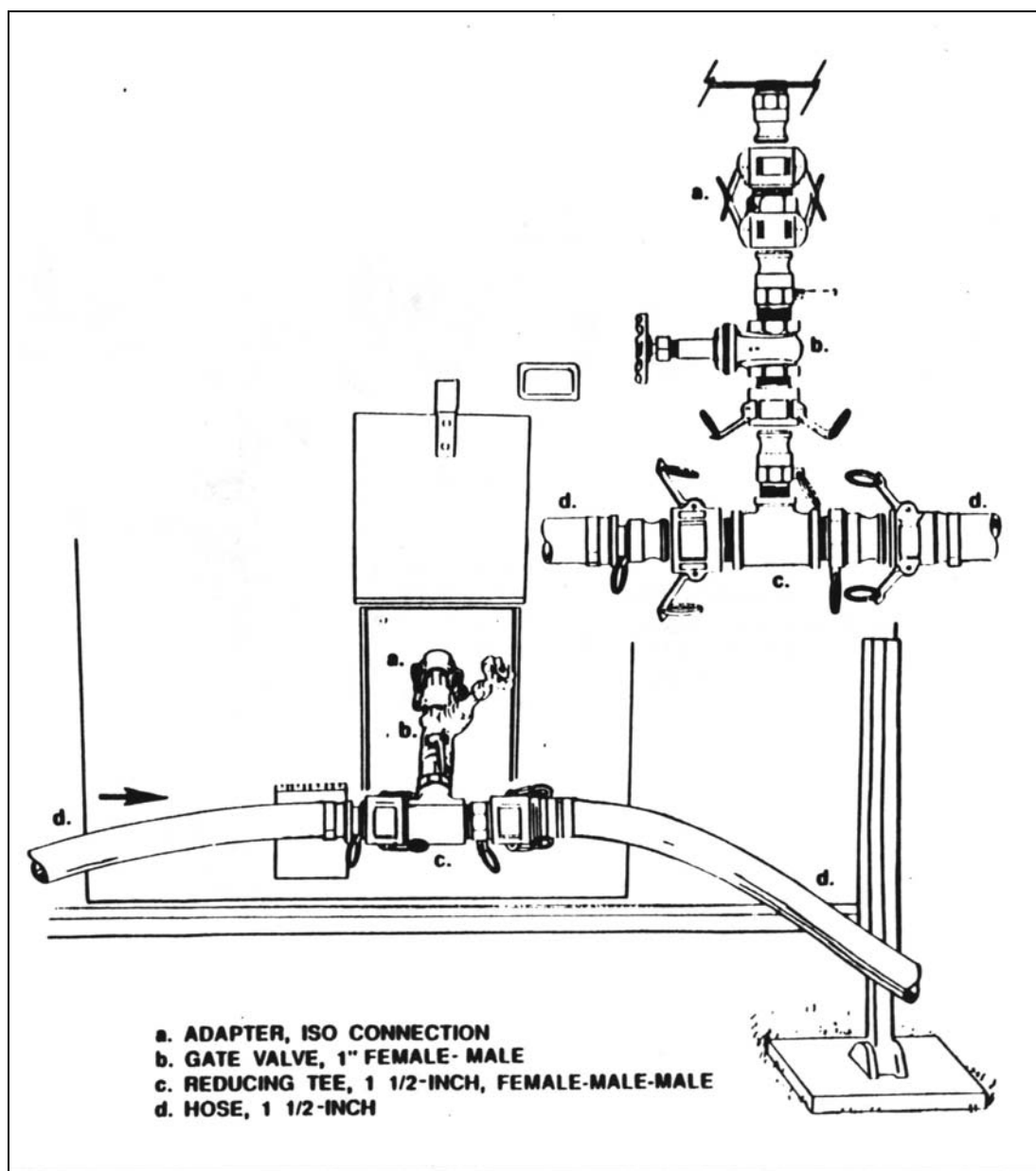


Figure 4-35
Connection to a Single Receptacle ISO (with hose)

k. Use the hose protection channels for hose that will cross TEMPER corridors. If conditions and time permit you may bury the hose and the channel protector, but it is not necessary. Run the hose under the edge of the tent flap and both layers of the floor. You may need to untie the floor tie-downs. Place the protective channel over a hose connection.

l. With the system laid out prepare for the assembly. Correct assembly of the hoses and cam-lock fittings is easier if the fittings are clean. Dirty or mud-encrusted connections must be cleaned off prior to assembly. It is absolutely essential to avoid contaminating the inside of the hoses and fittings. Follow the procedure below as closely as possible.

CAUTION
**Correct assembly of connections
is essential to avoid
contaminating the system.**

(1) Open the locking levers for both cam-lock connectors. **DO NOT REMOVE THE FEMALE DUST CAP OR MALE DUST PLUG.**

(2) Place the female connector on an elevated surface (such as the toe of your boot), that allows the opening of the fitting to be face up, or off the ground. This procedure, which applies to all connections, reduces the chance of contaminants entering the fitting.

(3) Lay the male fitting across the female fitting.

(4) Remove the dust plug from the female fitting.

(5) Holding the dust plug in your hand, remove the dust cap from the male fitting.

(6) Connect the dust plug and dust cap to each other. Close the locking levers and lay them on the ground.

(7) Connect the male and female hose connectors or valve fittings without allowing the fittings to touch the ground. Close the locking levers.

(8) If you find dirty connections during the assembly process, ensure that they are cleaned prior to assembly.

(9) Use this procedure to make all the connections in the system. One exception is the connection at the ISO. The male fitting on the ISO does not have a dust cap. Because of this, the dust plug from the female-female adapter will not have a matching connection.

Final checks to be done **BEFORE TURNING ON THE WATER.**

(1) Open all gate valves in the primary and secondary loop(s), and to the nozzles and ISOs.

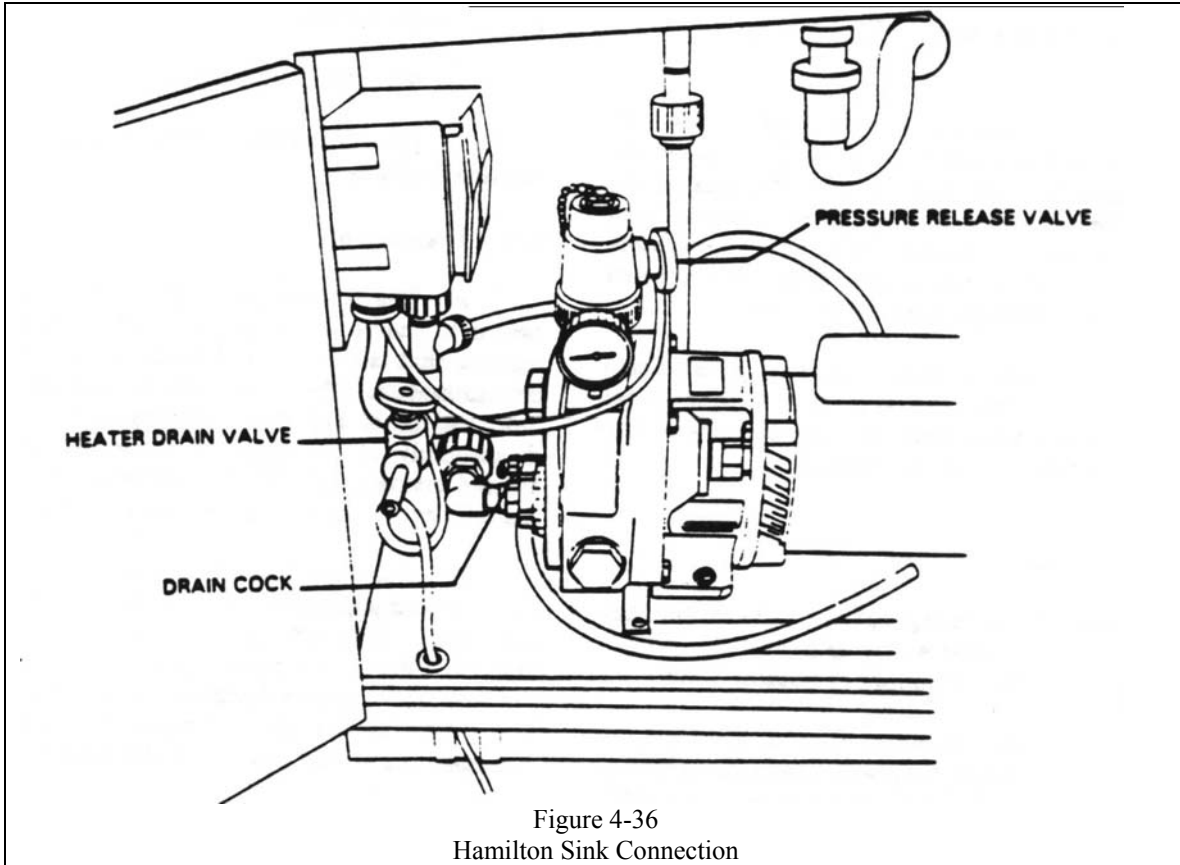
(2) Close all valves to the field sinks.

(3) Close the globe valves on the Interior wall panel of the ISO. Ensure the Hamilton sinks are ready by closing the:

(a) Drain cock on the pump.

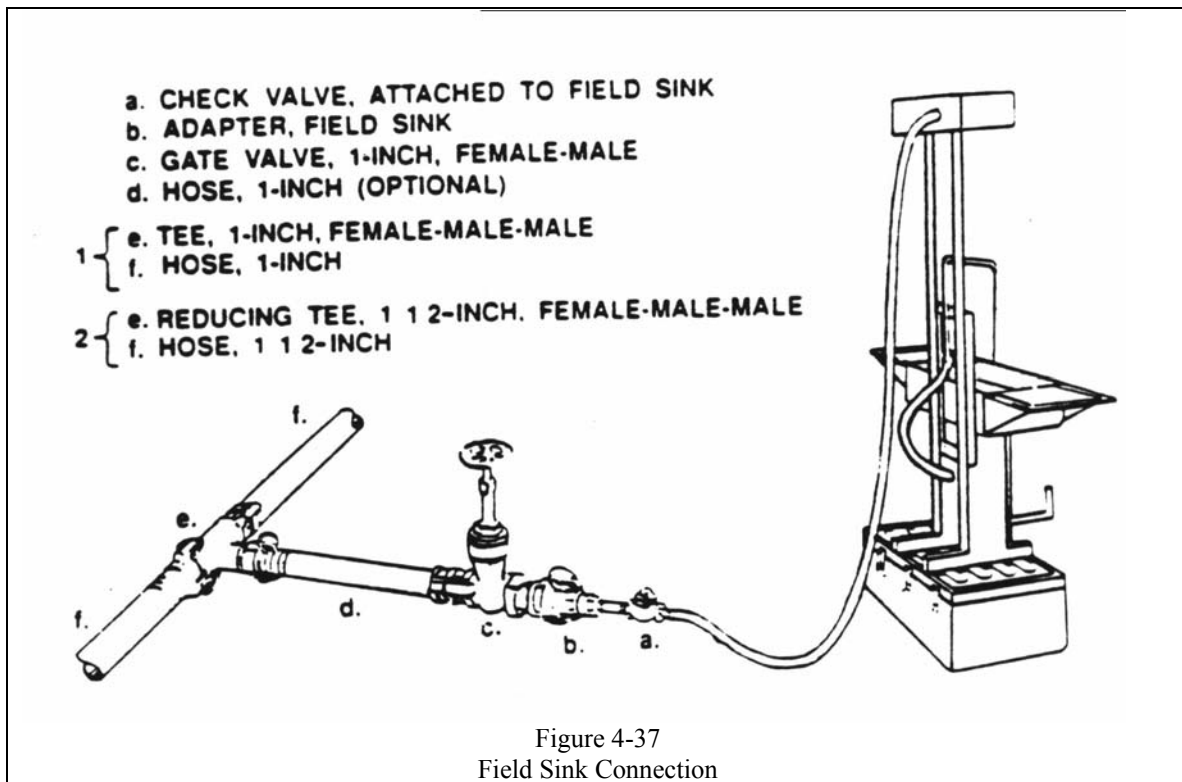
(b) Valve at the top of the pump body.

(c) Heater drain valve.



(4) Make sure that the field sinks are ready. Instruct users of the field sinks connected to the system to set them up

for gravity operation in accordance with the manufacturer's literature.



(5) With water in the storage tank(s) and all of the connections made:

(a) Open the valve on the storage tank immediately before the pump.

(b) Remove the nut at the top of the pump assembly body. Refer to TM 5-4320-274-14&P. With a water tank full of water the pump will prime itself. Removing the nut allows air to escape: water fills the pump body. Once water has reached the nut opening, replace the nut and tighten firmly.

(c) Open the gate valve at the return side of the water tank. If you are using more than one tank, open the valves between the tanks.

(d) Turn on the circuit for the pump.

(e) Turn on the circuit for the Hypochlorinator.

(f) Turn on the circuits for the in-line water heaters.

l. Adjust the rate of flow at the return side of the distribution system. Adjust the rate of flow with the gate valve so that the pressure gauge reads between 8 and 12 pounds per square inch (psi).

m. Adjust the flow at the secondary loop(s). The presence of water in the secondary loop(s) does not mean that water is flowing through the loop(s). To ensure water is flowing, gradually close the 1½ inch gate valve. Continue closing the valve until the flowmeter reads between 5 and 10 gallons per minute.

n. Return to the gate valve by the pressure gauge. After adjusting the flow for the secondary loop(s), the flow rate here may need to be adjusted. Use the gate valve to adjust the rate of flow until the pressure gauge reads between 8 and 12 psi.

o. Go to each Hamilton sink. Instruct the users to double-check that the sinks are ready. Have them open the globe valve on the ISO wall. Turn on the water. The initial water from the faucet may appear rusty. This is rust that was on the inside of the body of the pump in the Hamilton sink. Allow the water to run until the water clears.

p. Go to each field sink connected in the water distribution system. Instruct the users to open the gate valve, but not all the way. If there are any leaks anywhere but at the threaded fittings, defer the sink to maintenance. Users can correct leaks at the fittings by tightening them with a pair of pliers. It is up to the user to adjust the rate of flow to the sink with the gate valve.

q. Before the water is used, direct the field sanitation team to test the chlorine in the water storage tank(s). Then operate **EVERY** sink in the system for three to five minutes. Operate each nozzle for one minute. This flushes the system of potential contaminants that may have entered the hoses and fittings since last use.

r. Coordinate with preventive medicine personnel to inspect the system and take water samples. Coordinate also with regular preventive medicine for regular inspections and sampling.

2-5. Operation

The purpose of this paragraph is to ensure that the equipment is operated safely and that the system provides a continuous supply of potable water.

a. Monitor the water supply. Turn off the pump when the depth of water in the water tank is less than 8 inches. The bearings in the water pump will burn out if the pump impeller is not covered with water.

b. The field sanitation team should monitor the chlorine residual in the water supply. Measure chlorine residual at the water tank(s), and 20 percent (20%) of the sinks and nozzles in the distribution system daily. A chlorine residual is essential for preventing biological contamination. However, too high a chlorine residual will make the water taste bad.

c. Remove and clean the filter in the filter assembly daily. This requires shutting down the pumps, hypochlorinator and heaters. In order to minimize downtime, have a clean filter ready for immediate installation. Follow the procedure below to change the filter.

(1) Turn off power to the heaters.

(2) Turn off power to the hypochlorinator.

(3) Turn off the power to the pumps.

(4) Close the gate valve by the filter assembly.

(5) Change filters in the filter assembly.

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- (6) Open the gate valve.
- (7) Prime the pump.
- (8) Turn on the power to the pump.
- (9) Turn on power to the hypochlorinator.
- (10) Turn on power the power to the heaters.
- (11) Clean the old filter and place it in the storage container.

2-6. Disassembly.

a. The procedures discussed here will enable you to disassemble the system in a manner that is efficient and minimizes the chance of contamination. The procedure is intended to be independent of any other actions associated with the disassembly of the hospital. However, hose lines located inside a TEMPER must be removed before the tent can be disassembled.

b. Disconnecting the cam-lock fittings is **not** the first thing done in disassembly. However, it is the most frequent task and warrants being discussed first. This procedure is not the reverse of the assembly process previously discussed. The intent is the same though; disconnect with minimal risk of contaminating the system.

- (1) Unlock all four locking levers.
- (2) Separate the fittings. Rest the female fitting on a protective surface (**NOT ON THE GROUND**) with its

opening up. The toe of your boot will work.

(3) Lay the male fitting on the female fitting (or hose) in a way that prevents the male fitting from making contact with anything else.

(4) Separate the dust cap and dust plug. **DO NOT PLACE THEM ON THE GROUND.**

(5) Holding the dust plug, place the dust cap on the male fitting of the cam-lock.

(6) Place the dust plug in the female fitting of the cam-lock.

(7) Close all four locking levers.

c. Turn off power to the heaters.

d. Turn off power to the hypochlorinator.

e. Turn off the pump and close the valves on the water tank(s).

f. Determine the topographical low point in the water distribution system. At this point, disconnect a hose section and permit the water in the hose to drain by gravity. If there is not one clear topographical low point, disconnect the hose at several points to encourage gravity draining.

g. While the hoses are draining, drain the remaining water from the storage tank(s). The location of the tank(s) may not be well suited for emptying their contents in place. You may wish to connect one or more lengths of discharge hose and drain the tanks away from the hospital. Use the pump to

speed up the process. Set the pump up with suction hose, just as when laying the system out. Use as much hose as necessary to drain the tank(s) wherever you wish. **NOTE: Select a drainage location where the slope of the ground will not carry the water into the hospital area. NOTE: As the water storage tank empties, the water pump may become dry and subject to damage. Ensure that the water pump is in the water. Use caution to prevent the pump from running and burning up when the water level in the tank(s) falls below 6 inches.**

h. Once the tank(s) is empty, open the drain cock on the pump and let the pump body drain. Tip the pump up to remove any water remaining in the bottom of the pump body. Leave the drain cock open to allow the pump body to air-dry.

i. While the system is draining, disassemble the hose, starting at the water tank(s).

(1) Remove the gate valves and tee fittings before rolling hoses for storage. Reattach the dust caps and dust plugs to the fittings as you disconnect them. Place the fittings in the Cage, Wire, Folding. Put similar fittings in the same cage.

CAUTION
To prevent contaminants from entering the system, reattach dust caps and dust plugs to fittings and hoses before storage.

(2) When rolling hoses, leave the far end of the hose open to allow any remaining water to drain. If possible,

keep that end off the ground. If this is not possible, rinse the end of the hose before attaching the dust cap or dust plug.

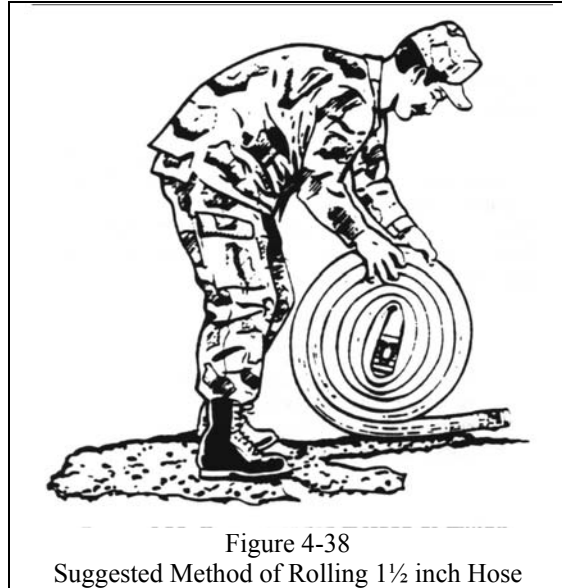


Figure 4-38
Suggested Method of Rolling 1½ inch Hose

(3) Several lengths of short hose can be rolled as one piece.

(4) 1-inch hose cannot be rolled in the same manner as 1½ inch hose. It must be fed into the rack and coiled in layers. Place one end of the hose against the inside wall and work toward the center of the cage.

j. Remove the hoses from the inside of the Tempers. The instructions here presume that the hose in the TEMPER is part of a secondary loop.

(1) Close all gate valves. This includes the valves to feeder lines, field sinks, and the valves at the beginning and end of the loop.

(2) Disconnect all feeder lines and field sinks from the secondary loop. Leave gate valves attached to the secondary loop.

(3) Disconnect the cam-lock connections immediately outside each end of the TEMPER. Lift one end of the hose and walk it through the TEMPER. Use caution as the fittings could rip the flooring.

CAUTION
Handle the hose inside the TEMPER with care. The fittings may damage the canvas or flooring.

k. As much as possible, store similar fittings in the same cage.

l. Prior to storing the flowmeters and pressure gauges, open the caps and plugs on each item and drain the water. Shake any additional water from each item before replacing the caps and plugs. Store them in the Case, Electrical-Electronic Test (NSN: 6625-01-449-2857, PN: 13229E7189).

m. Advise users of the Hamilton sink to open the drain cock, pressure release valve, and heater drain valve. All of these components are inside the sink base and covered in more detail and discussed in the Hamilton sink operator's manual. These steps allow water to drain from the pump and the heater. This prevents the formation of rust and growth of bacteria.

2-7. Preventive Maintenance.

The following preventative checks and services should be done periodically during operation. They should also be done prior to storing the equipment following completion of a mission or field training exercise.

a. *Water Storage Tanks.* Operator, Maintenance, and PMCS are addressed in the applicable Technical Manuals

b. *Pump.* Operator, Maintenance and PMCS are addressed in TM 5-4320-274-14&P and Chapter 5 of this manual.

c. *Discharge Hose.* Check hoses for abrasions, cuts, and gouges. Check for –

- Presence of bulges or seepage during operations.
- Presence and condition of locking levers.
- Presence and condition of hose clamps.
- Presence of cap and plug attached by chain and key rings.
- Abrasions on cam-lock fittings.
- Presence and condition of gaskets inside the female fittings and caps.

d. *Suction Hose.* Perform the same checks for the discharge hose. The shape of the hose is maintained by steel coils and should be generally round. If the hose is deformed (normally caused by vehicle traffic), use a rubber or lead hammer to restore the cylinder shape of the hose.

e. *Fittings and Valves.* Check –

- For cracks in the body of the fitting or valve.
- For leakage at the threads
- For broken or bent handles on gate valves.

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- To ensure that the nut at the top of the rising stem gate valve is secure.

f. *Gauges and Flowmeters.* In addition to functional checks during normal operations, check for –

- Cracked or broken glass.
- The presence of caps and plugs attached by chain and key rings.
- Presence and condition of gaskets inside the female fittings and caps.

2-8. Repair Procedures.

Part of the Water Distribution and Wastewater Management System (WDWWMS) is the WDWWMS Maintenance Set that includes an assortment of repair parts and critical tools to maintain the system. This set is fielded with the remainder of the system. It is the user's responsibility to replenish the components as needed.

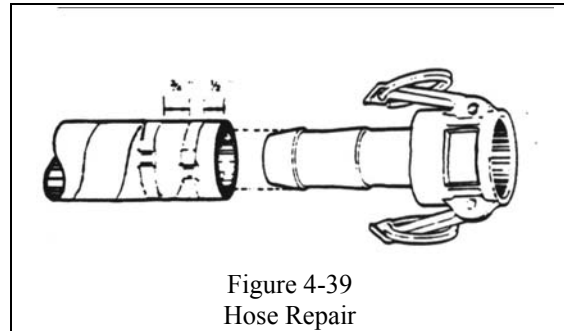
a. *Hose.* The repair procedures discussed here applies to both suction and discharge hoses.

(1) *Broken, torn, or punctured hose.* The principal behind repair services for a damaged hose is to make two good hose sections from one damaged one. Dispose of pieces of hose shorter than 2 feet.

(a) Use a hacksaw to cut the hose and remove the damaged portion.

(b) Place two hose clamps (from the maintenance set) over the newly cut end.

(c) Insert a hose coupling in the newly cut end, as far as it will go. The coupling must be the opposite gender of the cam-lock fitting on the other end of the hose.



(d) Position the hose clamps near the end of the fitting.

(e) Tighten the hose clamps and trim off the excess.

(f) Attach key rings, chain, and caps (or plugs).

(g) Repeat steps (b) through (f) for the other piece of hose.

b. *Fittings and Valves.* Replace missing or damaged caps, plugs, chains, and rings as needed. The complete fittings and valve assemblies are made up of individual parts that may be requisitioned separately. Should a fitting or valve become unserviceable, retain the serviceable parts for use in reassembling the fitting or valve. This can also be applied to the nozzle, flowmeters and pressure gauge.

Chapter 5

WASTE-WATER AUGMENTATION SET (WWAS)

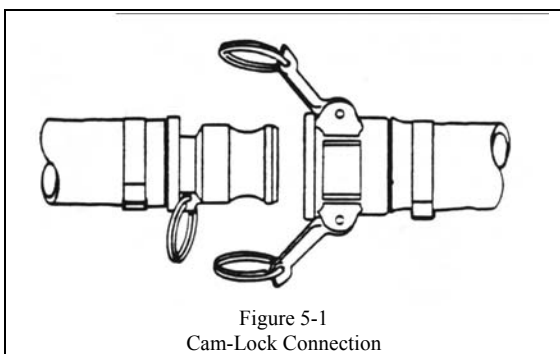
Medical Force 2000 (MF2K) 296 Bed Configuration

Operator, PMCS, and Repair Instructions

5-1. Introduction. The main reason for having this augmentation set is to allow the split-based operations of the Hospital Unit Surgical (HUS) and Hospital Unit Base (HUB) of the MF2K Combat Support Hospital.

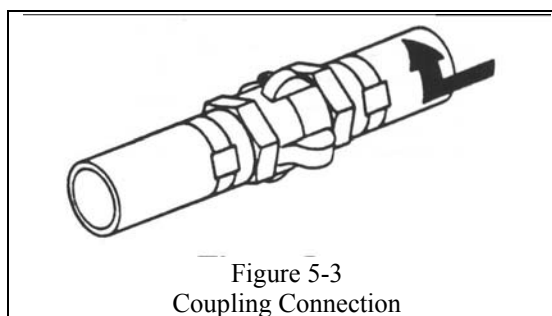
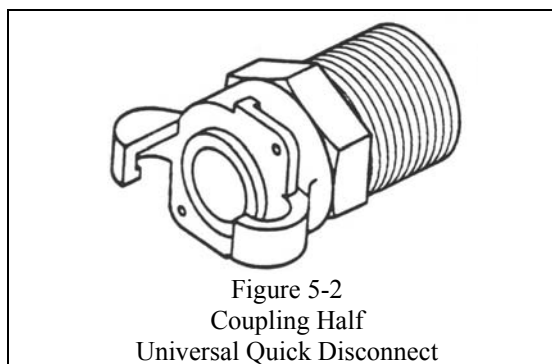
5-2. Components.

a. *Cam-Lock Connections.* As in the Water Distribution Set (WDS), components of this set use cam-lock fittings. Cam-lock is a quick disconnection system that requires no special training or tools. There are no threads on the parts or hoses to be connected. To use cam-lock fittings, the dust cap or plug is removed from each hose end, then insert the male end fitting into the female end of the other fitting. Pull the levers back towards the hose to cam-lock the two parts together. There are some steps to be followed in making and breaking a hose connection. These steps are discussed elsewhere in this.



b. *Coupling Halves.* The Universal Quick Disconnect (or coupling half) is made of galvanized steel and incorporates a rubber gasket to provide a watertight seal when the halves are connected. Two coupling halves will allow the connection of:

- (1) two hoses,
- (2) a hose and the Pump Assembly, Diaphragm (NSN: 4320-01-440-7388),
- (3) a hose and a Valve, Ball (NSN: 4820-01-440-5916)
- (4) a hose and a Wye, Quick Disconnect (NSN: 4730-00-496-5952)



Water Distribution and Wastewater Management System (WDWWMS)

c. *Water Storage Tanks.* The Waste-Water Augmentation has the following type and quantity of water storage tanks.

- LIN T19033 – Tank, Fabric Collapsible, 3,000 Gallon Capacity – 2 each (one for water distribution and one for wastewater collection).

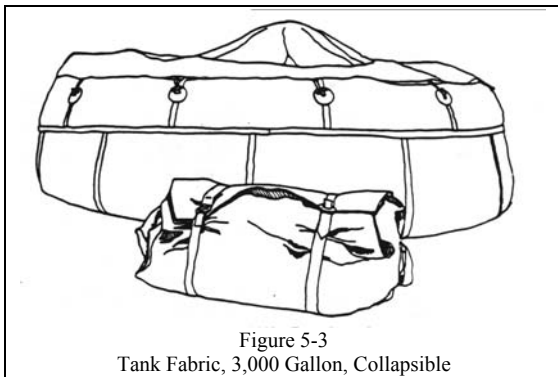


Figure 5-3
Tank Fabric, 3,000 Gallon, Collapsible

d. *Water Pumps.*

(1) Pump Unit, Centrifugal. The water pump contained within this set and used for potable water distribution is the Pump Unit, Centrifugal, 65 GPM [NSN 4320-01-440-4421]. It has a 220 volt, 3-phase, totally enclosed, fan-cooled, electric motor. Each water pump is supplied with an integral power cord (40') that terminates in a male Class "L" power connector. The plug interfaces directly with the DEPMEDS electrical distribution system. Each pump is outfitted with a male and female, 1 1/2-inch cam-lock connection. There is one pump in the WDS. One pump will serve the primary water distribution loop of the hospital, and the other is used to augment or maintain pressure through the secondary loops. For the MF2K configuration, a third pump is located in the Waste-Water Augmentation Set,

Hospital, DEPMEDS (WWAS) (LIN: W49603) (NSN: 6545-01-435-6013). The third pump will be used in the event that a Hospital Unit Base (HUB) and a Hospital Unit Surgical (HUS) operate independently.

CAUTION
Two persons are required to lift or carry a water pump.

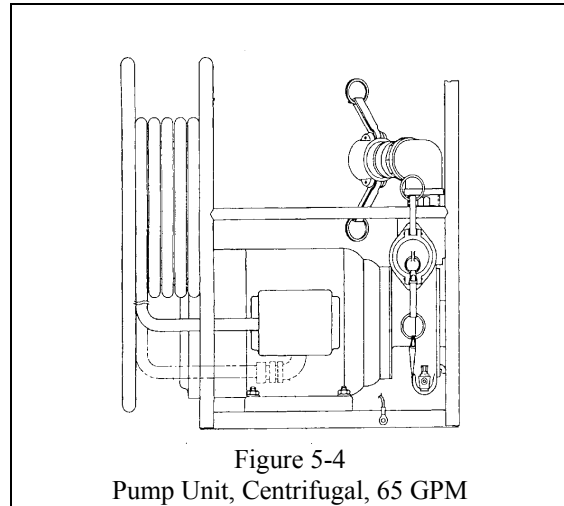


Figure 5-4
Pump Unit, Centrifugal, 65 GPM

(2) Pump Unit, Reciprocating. The wastewater pump contained within this set and used for wastewater evacuation is the Pump Unit, Reciprocating, [NSN: 4320-01-440-4421]. The electric motor driven pump is a portable, frame mounted, unit. It is designed to evacuate wastewater at the maximum rate of 2,600 gallons per hour, at 60 strokes per minute. The pump is equipped with a 3/4 HP (horsepower), capacitor start, ball bearing motor.

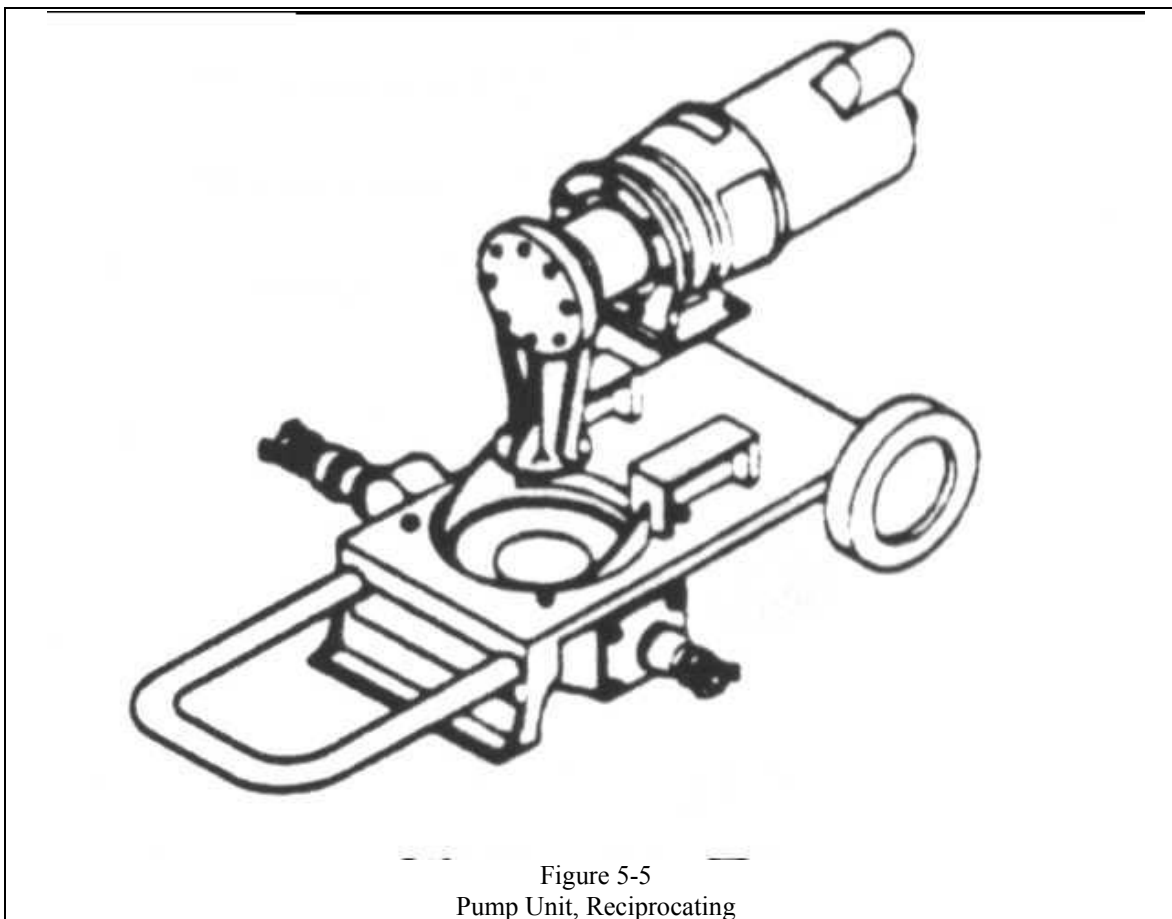


Figure 5-5
Pump Unit, Reciprocating

e. Hoses. The hoses that are contained within the WWAS are:

(1) Potable water hoses:

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8338)
PN: 13225E9136-14
5 feet in length, 1-inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-175-5958)
PN: 13229E9136-12
10 feet in length, 1-inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-177-3714)
PN: 13225E9136-13
20 feet in length, 1-inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8337)
PN: 13225E9136-15
50 feet in length, 1-inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8336)
PN: 13225E9136-17
5 feet in length, 1½ inch diameter

Hose Assembly, Nonmetallic
(Discharge)
(NSN: 4720-01-438-7779)
PN: 13225E9135-9
10 feet in length, 1½ inch diameter
Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8343)
PN: 13225E9136-9
10 feet in length, 1½ inch diameter

Water Distribution and Wastewater Management System (WDWWMS)

Hose Assembly, Nonmetallic
(NSN: 4720-01-438-8341)
PN: 13225E9136-10
20 feet in length, 1½ inch diameter

Hose Assembly, Nonmetallic
(NSN: 4720-01-140-6228)
PN: 13225E9136-4
20 feet in length, 4-inch diameter

(2) Wastewater hoses:

Hose Assembly, Rubber
(NSN: 4720-01-434-9646)
PN: 13229E7223-1
5 feet in length, 1-inch diameter

Hose Assembly, Rubber
(NSN: 4720-01-434-9594)
PN: 13229E7223-2
10 feet in length, 1-inch diameter

Hose Assembly, Rubber
(Drain hose for field sink)
(NSN: 4720-01-434-9627)
PN: 13229E7226
10 feet in length, 1-inch diameter

Hose Assembly, Rubber
(NSN: 4720-01-434-9605)
PN: 13229E7223-3
20 feet in length, 1-inch diameter

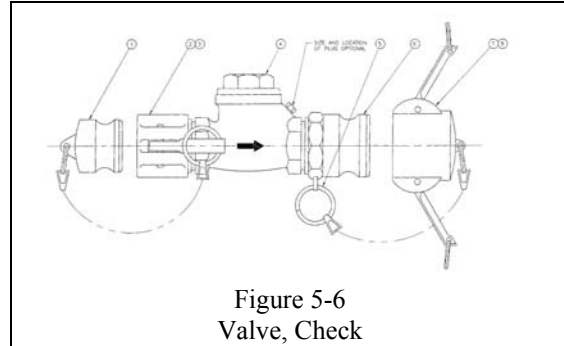
Hose Assembly, Rubber
(NSN: 4720-01-434-9649)
PN: 13229E7223-4
50 feet in length, 1-inch diameter

Hose Assembly, Rubber
(NSN: 4720-01-434-9638)
PN: 13229E5746-4
50 feet in length, 1½ inch diameter

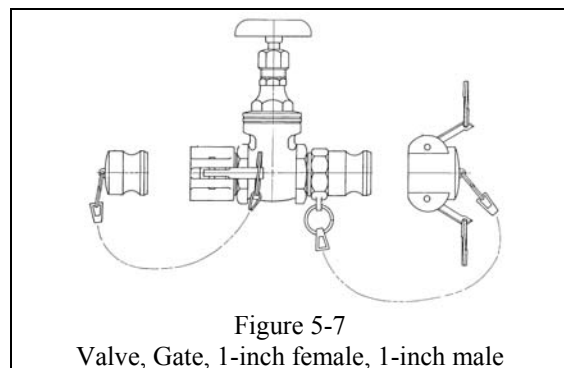
f. Fittings and Valves.

(1) Potable water:

(a) Valve, Check (NSN: 4820-01-440-5919, PN: 13229E7197)
This valve is used to keep water in the potable hose line from reversing flow.



(b) Valve, Gate, 1-inch female, 1-inch male (NSN: 4820-01-440-7798, PN: 13229E7167). When used with individual water users, such as field sinks and nozzles this valve controls the rate of flow. It is also used at the beginning of secondary loops and long one-way water lines. Used this way, repairs or changes in the secondary loops can be made without interrupting water supply to the rest of the hospital.



(c) Valve, Gate, 1½ inch female, 2-inch male (NSN: 4820-01-440-8302, PN: 13229E7177). This valve is attached to the female cam-lock of the Reducer, 4" M, 2" F (NSN: 4730-01-186-0821) (PN: AA59326XI-1-10) which will be used on the Tank Assembly, Fabric Collapsible (20,000

Water Distribution and Wastewater Management System (WDWMS)

gallon) (LIN: T12938, NSN: 5430-01-406-0507).

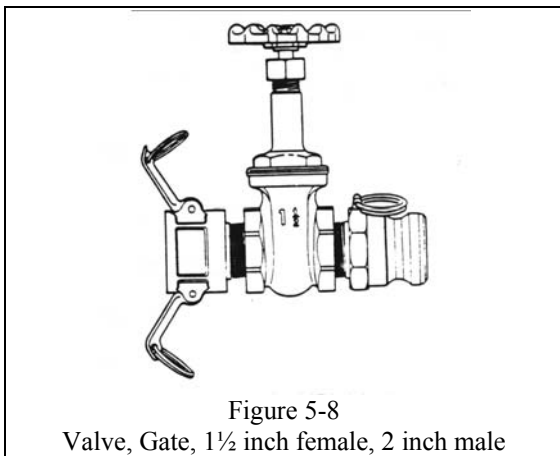


Figure 5-8

Valve, Gate, 1 1/2 inch female, 2 inch male

(d) Valve, Gate, 2-inch female, 1 1/2 inch male (NSN 4820-01-440-8306) (PN: 13229E7178). This valve is attached to the male cam-lock of the Reducer, 4" F x 2" M (NSN: 4730-01-064-0560, PN: AA59326XI-1-9) which will be used on the Tank Assembly, Fabric Collapsible (20,000 gallon) (LIN: T12938, NSN: 5430-01-406-0507).

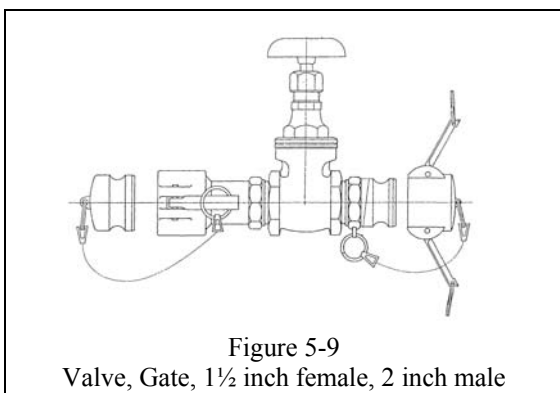


Figure 5-9

Valve, Gate, 1 1/2 inch female, 2 inch male

(e) Valve, Gate, 4-inch female, 4-inch male (NSN: 4820-01-440-8765, PN: 13229E7169).

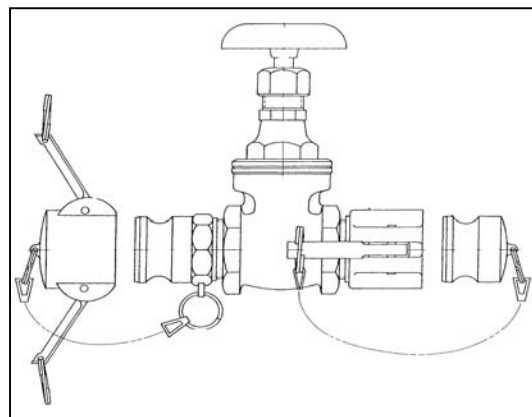


Figure 5-10

Valve, Gate, 4-inch female, 4-inch male

(f) Valve, Globe, 1 1/2 inch female, 1 1/2 inch male (NSN: 4820-01-440-8765, PN: 13229E7169). This valve is attached to the 1 1/2 inch loop, immediately after the beginning of a 1-inch loop. It is also used when multiple water tanks are arranged in parallel. In this application, the valve is manually adjusted to control the rate of flow in the system.

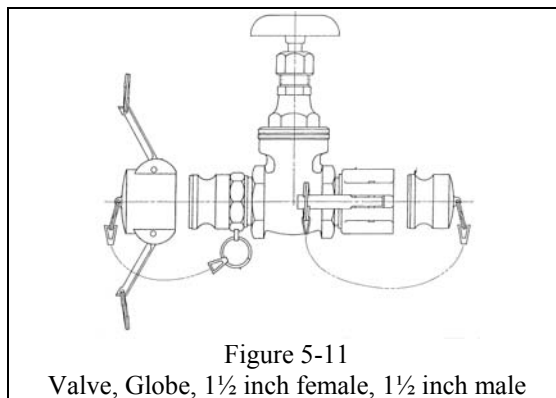
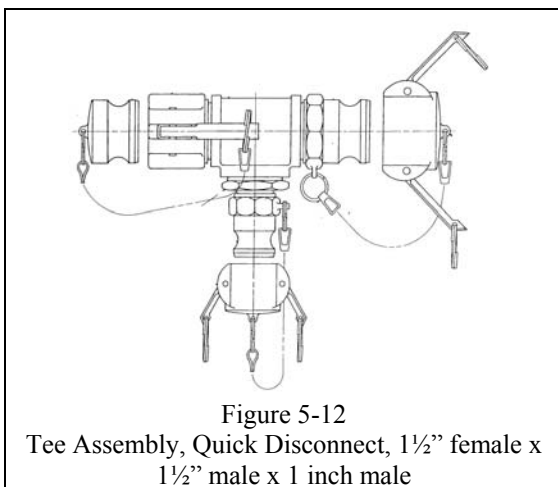


Figure 5-11

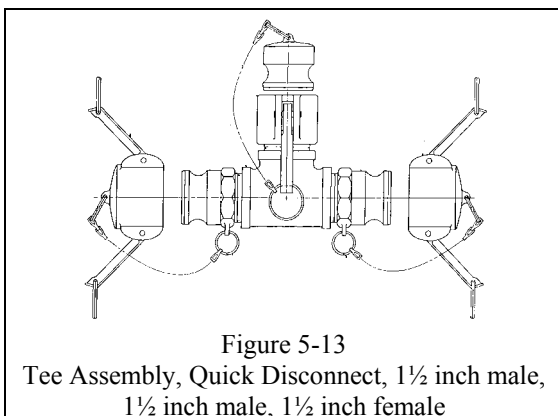
Valve, Globe, 1 1/2 inch female, 1 1/2 inch male

(g) Tee Assembly, Quick Disconnect, 1 1/2" female x 1 1/2" male x 1 inch male (NSN: 4730-01-440-4609, PN: 13229E7172). This fitting is used at each place where the one-way feeder lines branch off to the individual users, such as CMS, pharmacy, X-Ray, laboratory, etc. It is also used at the

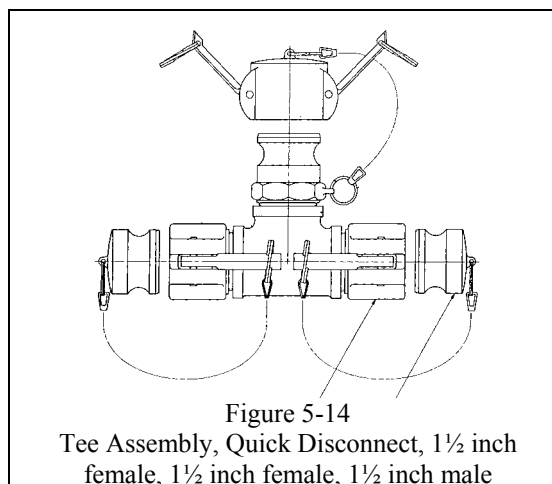
beginning and end of the secondary loop.



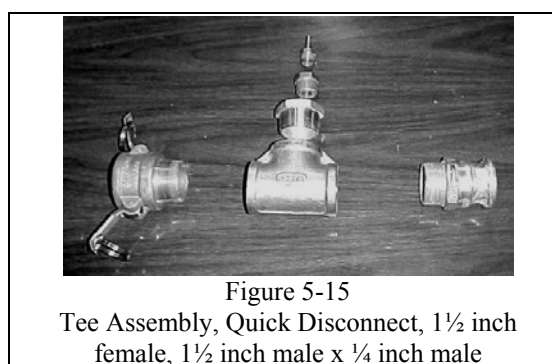
(h) Tee Assembly, Quick Disconnect, 1 1/2 inch male, 1 1/2 inch male, 1 1/2 inch female (NSN: 4730-01-440-4633, PN: 13229E7182)(see figure A-10). This fitting is used on the return side of the primary loop.



(i) Tee Assembly, Quick Disconnect, 1 1/2 inch female, 1 1/2 inch female, 1 1/2 inch male (NSN: 4730-01-440-4615, PN: 13229E7181). This fitting is located between the Tank Assembly, Fabric Collapsible (5,000 Gallon) and the Pump Unit, Centrifugal, 65 GPM [NSN 4320-01-440-4421] when two or more Tank Assembly, Fabric Collapsible (5,000 Gallon) are employed in parallel.



(j) Tee Assembly, Quick Disconnect, 1 1/2 inch female, 1 1/2 inch male x 1/4 inch male (NSN: 4730-01-487-3575) is used to connect the Hypochlorination Unit (NSN: 4610-01-435-4884) (PN: WAL-1031-96) to the primary loop.



(k) Coupling Assembly, Quick Disconnect, 1 inch female x 1 inch female (NSN: 4730-01-440-8569, PN: 13229E7173). This coupler is commonly referred to as a "Gender Changer". It is used when a male outlet is connected to a second male connection and as a connection on the Hamilton Sink connections for the ISO containers.

Water Distribution and Wastewater Management System (WDWMS)

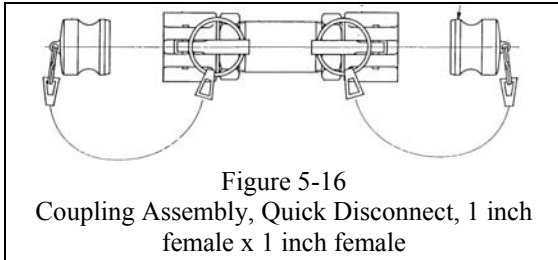


Figure 5-16
Coupling Assembly, Quick Disconnect, 1 inch
female x 1 inch female

(l) Plug, Quick Disconnect
(NSN: 4730-01-415-6403, PN:
13229E7170). This fitting is used in
conjunction with Adapter, Straight Hose
to Boss (NSN: 4730-01-415-6420,
PN: 13229E7195) to connect field sinks
to the water loop.

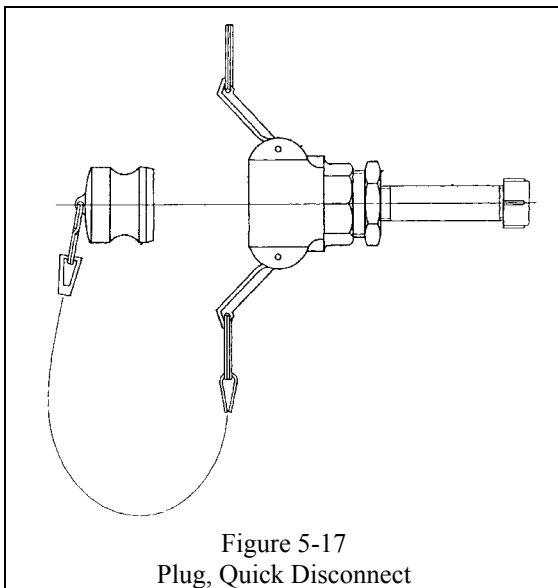


Figure 5-17
Plug, Quick Disconnect

(m) Adapter, Straight Hose to
Boss (NSN: 4730-01-415-6420, PN:
13229E7195). This fitting is used in
conjunction with Plug, Quick
Disconnect (NSN: 4730-01-415-6403,
PN: 13229E7170) to connect field sinks
to the water loop. This is the first
example where both connections are not
cam-lock.

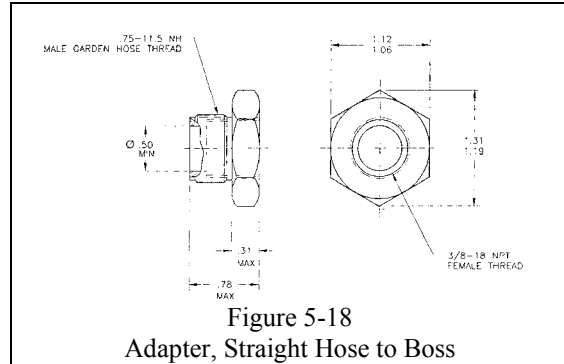


Figure 5-18
Adapter, Straight Hose to Boss

(3) Wastewater:

(a) *Adapter, Sink.* (NSN: 6545
-01-434-9630, PN: 13229E7224) The
sink adapter consists of a pipe to hose
adapter, a reducing pipe coupling, and a
universal quick disconnect coupling half.

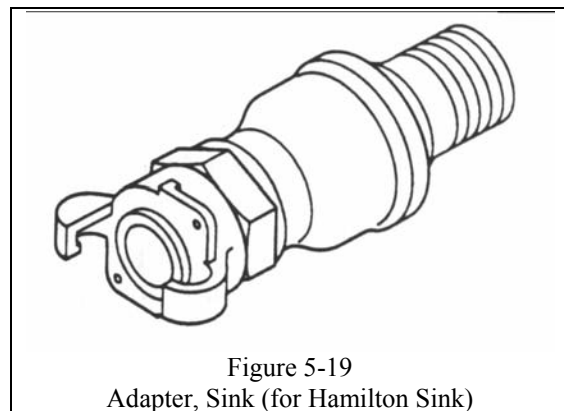


Figure 5-19
Adapter, Sink (for Hamilton Sink)

(b) Wye, Quick Disconnect
(NSN: 4730-00-496-5952, PN: WW-C-
633-M)

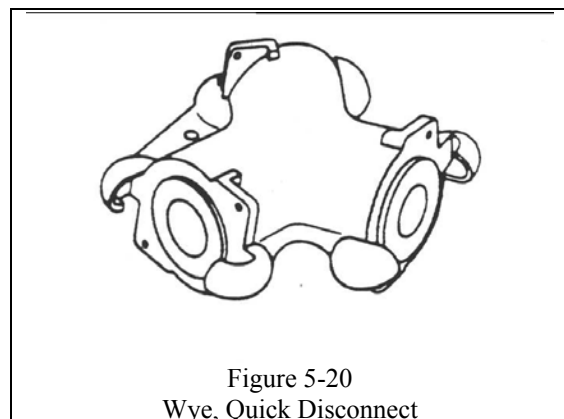


Figure 5-20
Wye, Quick Disconnect

Water Distribution and Wastewater Management System (WDWWMS)

(c) *Valve, Ball.* (NSN: 4820-01-440-5916, PN: 13225E7225) The ball valve provides a means to close off the WWMS. It is used near the funnel and stand assemblies.

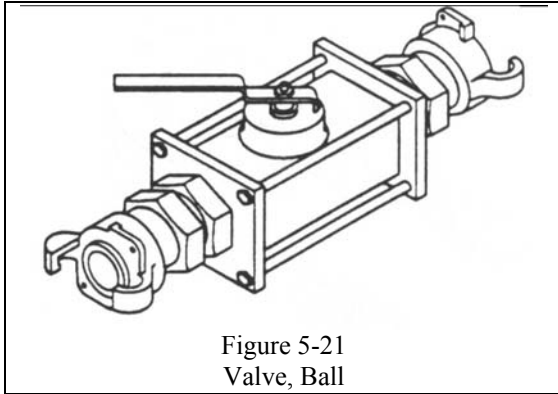


Figure 5-21
Valve, Ball

g. Other Components:

(1) Potable Water:

(a) *Pipe Assembly, Potable Water* (NSN: 4610-01-440-4086, PN: 13229E7162). This component measures the water pressure in the distribution system. This gauge is generally placed at the return end of the main loop. Its precise location depends on how the tanks are employed. **THE PRESSURE GAUGE IS FRAGILE.** When not in use, store it in the Case Electrical-Electronic Test (NSN: 6625-01-449-2857, PN: 13229E7189).

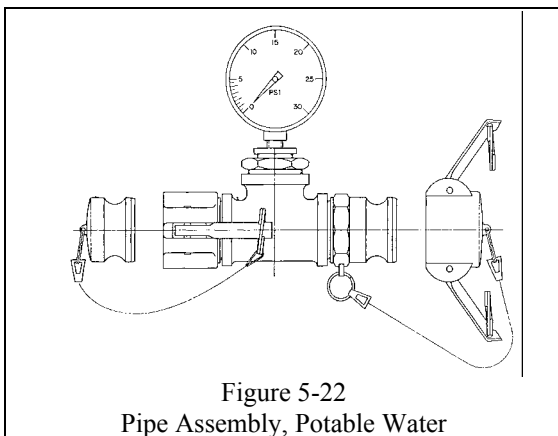


Figure 5-22
Pipe Assembly, Potable Water

(b) *Pipe Assembly, Potable Water* (NSN: 4610-01-440-4088, PN: 13229E7165). The water distribution system uses a flow meter that measures flow rates up to 100 GPM. It is placed at the end of the primary loop, immediately before the pressure gauge. **FLOW METERS ARE FRAGILE.** When not in use, store them in the Case Electrical-Electronic Test (NSN: 6625-01-449-2857, PN: 13229E7189).

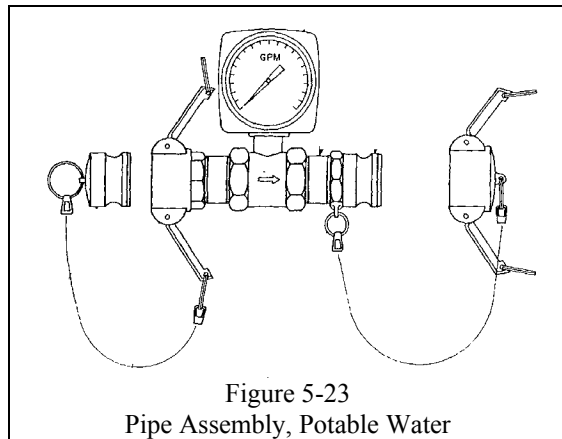


Figure 5-23
Pipe Assembly, Potable Water

(c) *Indicator Assembly* (NSN: 4610-01-440-4090, PN: 13229E7163). This assembly is used to monitor water flow through the distribution system. **THIS ASSEMBLY IS FRAGILE.** When not in use, store it in the Case Electrical-Electronic Test (NSN: 6625-01-449-2857, PN: 13229E7189).

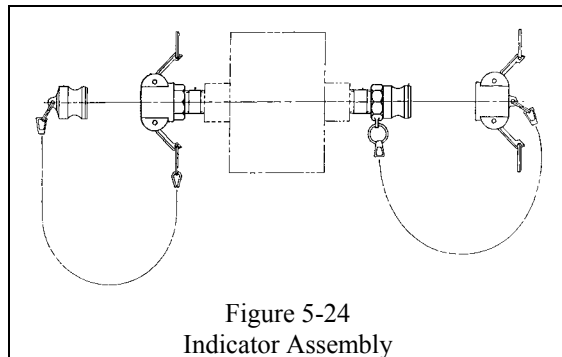
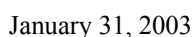
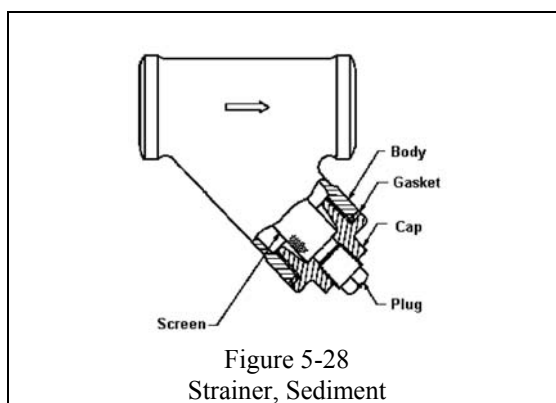
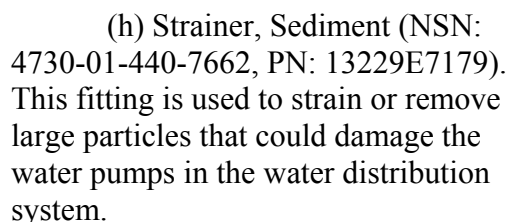
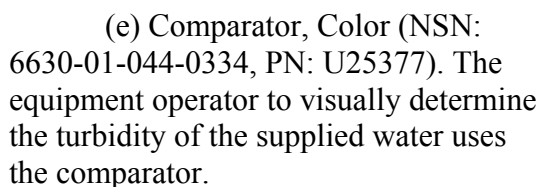
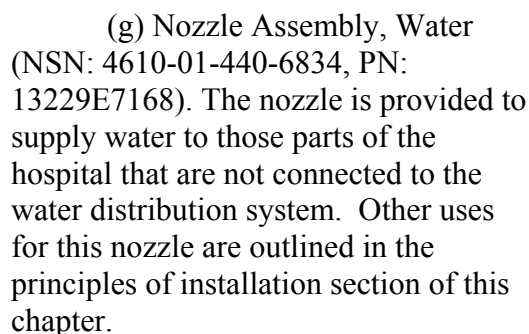


Figure 5-24
Indicator Assembly

(d) Case Electrical-Electronic Test (NSN: 6625-01-449-2857, PN: 13229E7189). This case is used to store the pressure gauges, flow meters, indicator assembly and color comparator.



Water Distribution and Wastewater Management System (WDWMS)



Figure 5-29
Storage and Retrieval Material System

(j) Can, Water, Military (NSN: 7240-00-089-3827, PN: MIL-C-43613). This is used for mixing the Sodium, Hypochlorite Technical (NSN: 6810-01-358-4336, PN: 13229E0923) and water for use in the Hypochlorination Unit (NSN: 4610-01-435-484, PN: WAL-1031-96).

(l) Pump Unit, Centrifugal (NSN: 4320-01-440-4421, PN: 13229E7159). The water pumps are supplied with the water distribution set. The water pumps are outfitted with quick-disconnect (cam-lock) fittings, and are rated at producing a 65 GPM water flow.



Figure 5-30
Pump Unit, Centrifugal

(m) Hypochlorination Unit (NSN: 4610-01-435-4884, PN: WAL 1031-96). This item is designed to treat and chlorinate the water within the water distribution system. The addition of chlorine based material to the water supply helps retard bacterial and fungal growth within the hoses. It is also designed to provide the capability to flush (hyper-chlorinate) the water lines.



Figure 5-31
Hypochlorination Unit

Water Distribution and Wastewater Management System (WDWWMS)

(2) Wastewater: Pipe, Culvert, Metallic (NSN: 4710-00-057-7252, PN: MIL-P-236)

(3) Multi-use:

(a) Channel, Hose Protector (subsurface) (NSN: 4720-01-440-4928, PN: 13229E7175). This item is used to protect hoses.

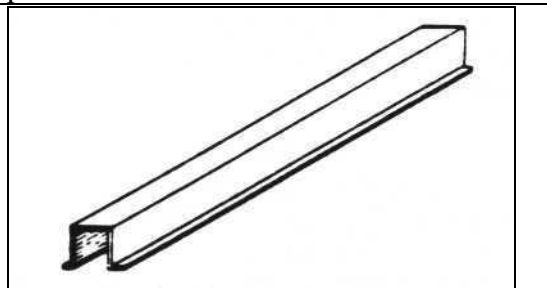


Figure 5-32
Channel, Hose Protector (subsurface)

(b) Channel, Hose Protector (surface) (NSN: 4720-01-440-4925, PN: 13229E7176). This item is used to protect hoses.

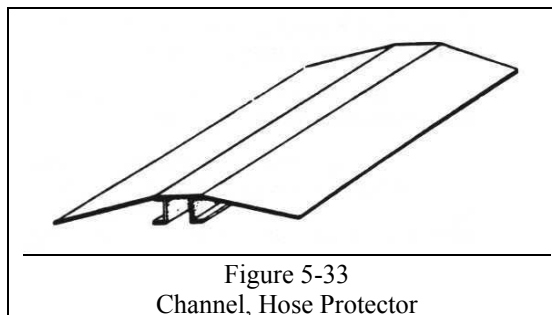


Figure 5-33
Channel, Hose Protector

Chapter 6

Operator, Organizational, Direct Support, and General Support Maintenance Manual

Including

Repair Parts and Special Tools List

**PUMP, CENTRIFUGAL: FRAME MOUNTED, 1½ IN.
MIL-P-14515D, ELECTRIC MOTOR DRIVEN,
(E.C. SCHLEYER PUMP CO. MODEL 4M-SE2000)**

NSN 4320-01-01-5888

INTRODUCTION

6.1. Scope

This chapter is for your use in operating and maintaining the E.C. Schleyer Pimp Co. Model 4M-SE2000 electric motor driven pump. This chapter provides information relative to the operation, preventive maintenance and organizational maintenance of the equipment. It also provides information on the direct support and general support maintenance, repair instructions, and provides information on administrative storage.

6.2. Maintenance Forms and Records

Maintenance forms and records that you are required to use are explained in TM 38-750.

6.3. Equipment Serviceability Criteria (ESC)

This equipment is not covered by an ESC.

6.4. Description

a. General. The electric motor driven pump (figure 6-1) is a portable, frame-mounted unit designed to pump water at the rate of 65 gpm (gallons per minute) at 50 ft-tdh (feet-total dynamic head).

b. The pumps is equipped with a Baldor Electric Co. motor, model 617m. The motor is a 2 hp (horsepower) unit encased in a heavy-duty housing. It is a totally enclosed fan cooled motor provided with permanently lubricated bearings, and watertight terminal box.

c. If you need a detailed description of any component of the electrical motor drive pump, refer to the applicable organizational maintenance information.

6.5. Identification and Tabulated Data

Water Distribution and Wastewater Management System (WDWWMS)

The E.C. Schleyer pump, Model 4M-SE2000, has three identification plates. The information on these plates follows:

a. Identification Plate.

Manufacturer	E.C. Schleyer Pump Co, Inc.
Model	4M-SE2000
Serial	R113 (through R523)
Nomenclature	Pump, centrifugal, self-priming, frame mounted, 1½ in.
Capacity	65 gpm
NSN	4320-01-010-5888
Drive	EMD (Electric motor driven)
Contract	DSA700-75-C-8357
Code Ident	97403

b. Pump Manufacturers Identification Plate.

Nomenclature	Pump, centrifugal, 1½ in., frame mtd. EMD, fresh water, 65 gpm, 50ft. head
Model	4M-SE2000
Contract	DSA 700-75-C-8357
Serial	R113 (through R523)
Capacity	Blank
Registration No	Blank
GVW	Blank
Length	21 in. (53.3 centimeters)
NSN	4320-01-010-5888
Date Mfd.	As applicable
Height	22 in. (55.8 centimeters)
Eng Sr	Blank
Ship Wt	110 lb. (49.5 kilograms)
Width	13 in. (33 centimeters)
Warranty	Blank
Month	Blank
Miles	Blank
Cube	4 cu ft (0.112 cubic meters)
Date shipped	As applicable
Date Insp.	As applicable
Mfd by	E.C. Schleyer Pump Co., Inc., Anderson, Indiana
Insp. Stamp	As applicable

Manufacturer	Baldor Electric Company
Model	617M
Type	Induction
Phase	3
Volts	205
Amperes	5.7
Hertz	60
Horsepower	2
Revolutions per Minute	3,450
Enclosure	TEFC
Duty	Continuous

SHIPPING DIMENSIONS

LENGTH	21 INCHES (53.3 CENTIMETERS)
WIDTH	13 INCHES (33 CENTIMETERS)
HEIGHT	22 INCHES (55.8 CENTIMETERS)
WEIGHT	110 POUNDS (49.5 KILOGRAMS)

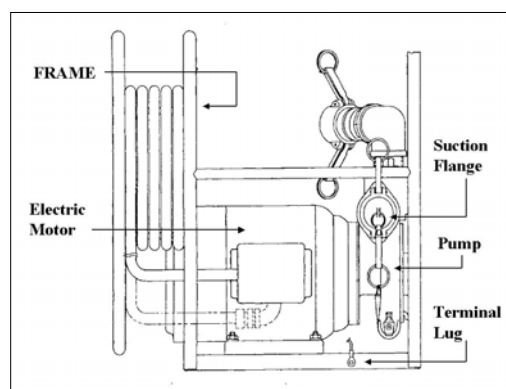


Figure 6-1. Electric motor driven pump (front view)

c. Motor Manufacturers Identification Plate.

OPERATING INSTRUCTIONS

WARNING

If equipment fails to operate, refer to troubleshooting procedures in the Operator and Crew Maintenance Instructions

6.6. Operation of Centrifugal Pump

a. The instructions in this section is published for the information and guidance of the personnel responsible for the operation of the pumping units.

b. The operator must know how to perform every operation of which the pumps units are capable. This section gives instructions on starting and stopping the pump units, operation of the pump units, and on coordinating the basic motions to perform the specific tasks for which the equipment was designed. Since every job presents a different problem, the operator must have to vary given procedures to fit the individual job.

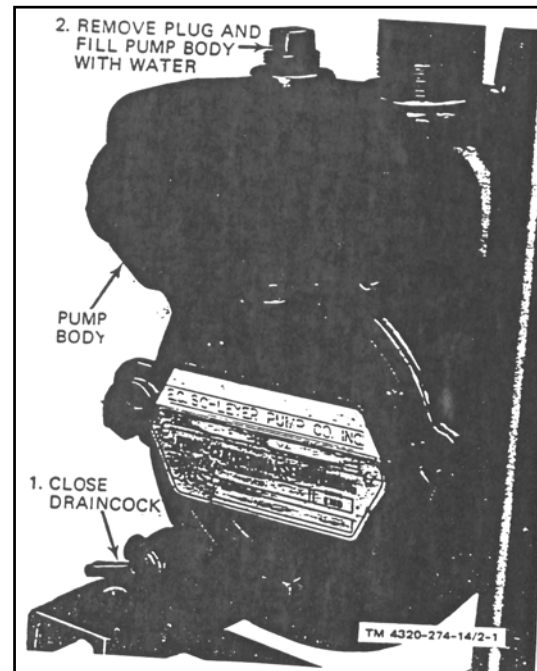


Figure 6-2

6.7. Starting

a. Preparation for starting.

(1) Refer to paragraph 6.18 and table 6.1 to perform the daily preventive services.

(2) Reference to figure 6-2 and prime the pumping unit.

b. Starting Instructions. To start the electric motor powered pump connect the power cable to a 3 phase, 208-volt, 60 hertz power source.

6.8. Stopping.

Disconnect the power cable from the source of power.

6.9. Operation of Equipment.

The operation of the pump is largely automatic. The operator should maintain constant watch for overheating, failure to perform to rated efficiency, and vibration. Proper care and maintenance will insure efficient operation.

CAUTION

Never operate the pump until the body has been filled with water. Operating the pump dry will destroy the seal. When not in use, make sure the body is drained.

OPERATION UNDER UNUSUAL CONDITIONS

6.10. Operation in Extreme Cold.

- a. Keep the unit free of snow and ice. Cover the unit when not in use. Provide a suitable shelter for the unit during outside operation.
- b. To avoid freezing, drain the pump after operation.
- c. In extreme cold it may be necessary to preheat the pump body; apply heat cautiously and sparingly.

CAUTION
Do not overheat the pump body.

6.11. Operation in Extreme Heat.

- a. Protect the unit from the direct rays of the sun.
- b. Maintain adequate space around the unit to provide heat dissipation. If operating in an enclosure, provide a fan to circulate air when possible.
- c. Keep the unit clean to provide proper heat transfer to the air.

6.12. Operation in Dusty or Sandy Areas.

Shield the unit from dust. Take advantage of natural barriers which offer protection from blowing sand and/or dust, or erect a suitable shield if necessary.

6.13. Operation Under Rainy or Humid Conditions.

- a. Cover the unit with a waterproof cover when outside and inoperative. During operation, take advantage of natural barriers which offer protection from storms, or erect a suitable shelter to protect the unit.
- b. Keep electrical cables, wires, and parts free of moisture and clean.

6.14. Operations in Salt Water Areas.

- a. Salt water caused corrosive action on metal. Exercise care to keep the unit from contact with salt water. Wash the unit frequently with fresh water.
- b. Paint all exposed non-polished metal surfaces with standard issue rust preventative, if available, or cover with a light coating of grease.
- c. Flush the pump if salt water has entered the pump body. Flush if there has been a possibility of salt water contamination.

OPERATOR/CREW MAINTENANCE INSTRUCTIONS

6.15. General.

The electric motor powered pumps require no periodic lubrication.

6.16. Detailed Lubrication Information.

The electric motor powered pumps have been pre-lubricated at the factory and require no specific lubrication. It may be necessary to use fine oil around the bearings supporting the shaft in certain areas of operation. The operator should maintain a constant watch for lubrication failures.

6.17. Preventive Maintenance Checks and Services (PMCS) – General.

To insure that the pumping units are ready for operation at all times, they must be systematically inspected so that defects may be discovered and corrected before they result in serious damage or

failure. The necessary preventive maintenance checks and services (PMCS) to be performed are listed in paragraph 6.18 and table 6.1. Defects discovered during operation of the unit will be noted for future correction, to be made as soon as operation has ceased. Stop the unit immediately if a deficiency is discovered during operation which would damage the equipment if operation were continued. All deficiencies and shortcomings will be recorded together with the corrective action taken on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) at the earliest opportunity.

6.18. Preventative Maintenance Checks and Services (PMCS).

Refer to Table 6.1 for the applicable PMCS.

Water Distribution and Wastewater Management System (WDWWMS)

Table 6.1. Preventative Maintenance Checks and Services (PMCS)

		B – Before Operation A – After Operation	D – During Operation W – Weekly
Interval and Sequence No.	Item to be Inspected Procedure		
B D A W			
1	ELECTRICAL LINES AND CONNECTIONS Inspect lines for breaks and frayed insulation. Check for loose connections.		
2	DRAINCOCK Check for leaks, improper operation, and other damage.		
3	ELECTRIC MOTOR FAN GUARD Inspect for dirt, foreign matter and damage. The openings of the fan guard shall be clean and free of foreign matter and shall show no damage.		
4	ELECTIC MOTOR Check to see that the motor is securely mounted. The exterior surface of the motor should be clean, free of dust, dirt, grease and fungus. All connections and terminals shall be secure.		
5	PUMP BODY Inspect for cracks, leaks, or other damage. The exterior surface should be clean, free of dust, dirt, grease, and fungus.		
6	PUMP UNIT Inspect the entire unit for operational damage.		
7	PUMP UNIT Clean the pump unit with clear water, rinse, and wipe dry.		
8	SUCTION VALVE Check the suction valve for proper operation and leaks.		

TROUBLE SHOOTING

6.19. General

a. This section contains troubleshooting information for locating and correcting most of the operating troubles that may develop in the electrical motor driven pump. Each malfunctions for an individual component, unit, or system is followed by a list of tests or inspections that will help you to determine probable causes and corrective actions to take. You should perform the tests/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or it not corrected by listed corrective actions, notify your supervisor.

NOTE

Before you use this table, be sure you have performed all applicable operating checks.

Table 6.2. Troubleshooting

Malfunction

Test or Inspection

Corrective Action

ELECTRIC MOTOR

1. ELECTRIC MOTOR FAILS TO FUNCTION PROPERLY

Check for loose or corroded wiring connections

Clean corroded connections. Tighten loose connections at electric motor and ground

2. ELECTRIC MOTOR OVERHEATS

Step 1: Check power source voltage.

If the power source is too low, too high, or unbalanced, connect the electric motor to a proper power source.

Step 2: Check motor for binding.

If the motor has restrictive rotation, notify organizational maintenance.

PUMP

3. PUMP FAILS TO FUNCTION PROPERLY

Check to see if air is entering pump body through loose connections.

Tighten loose connections and be certain hoses have no leaks.

Water Distribution and Wastewater Management System (WDWWMS)

Table 6.2. Troubleshooting (continued)

Malfunction

Test or Inspection

Corrective Action

4. PUMP LEAKS DURING OPERATION

Inspect for any visible leakage near seal or suction valve.

Notify organizational maintenance, when leakage occurs.

5. NO WATER OR INSUFFICIENT WATER OUTLET PRESSURE

Step 1. Ascertain if pump is primed.

Prime pump.

Step 2. Inspect suction line for clogging.

Remove the suction line, clean clogged area and replace on unit.

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

SERVICE UPON RECEIPT OF EQUIPMENT

6.20. Inspecting and Servicing Equipment

a. Inspection

(1) Make a complete visual inspection of the unit to assure that all accessories, attachments, publications and required tools have been delivered with the pumping assembly.

(2) Inspect the unit for loss of parts or hardware.

(3) Rotate the pump by hand prior to starting the unit; this will assure freedom of action of components.

(4) If used equipment is being inspected, pay particular attention to all inspection procedures.

b. Servicing Equipment

(1) Equipment is shipped complete and ready for operation.

(2) Perform the daily preventative maintenance checks and services (paragraph 6.18).

6.21. Installation of Separately Packed Components.

The pumps are packed as a single unit and therefore require no specific instructions for the installation of separately packed components.

6.22. Installation and Setting Up Instructions.

a. Set the unit on a base of sufficient strength to support its weight and as level as possible and not more than 25 feet above liquid.

b. Connect suitable hose lines to the suction and discharge flange adapters.

c. Connect the electric leads to the power cable as shown in figure 6.3.

NOTE

The cable has four color-coded conductors. The green conductor has an oversize lug at one end and is connected to the large pin of the plug connector. It is used to connect the frame of the electric motor to the power source ground system.

Water Distribution and Wastewater Management System (WDWMS)

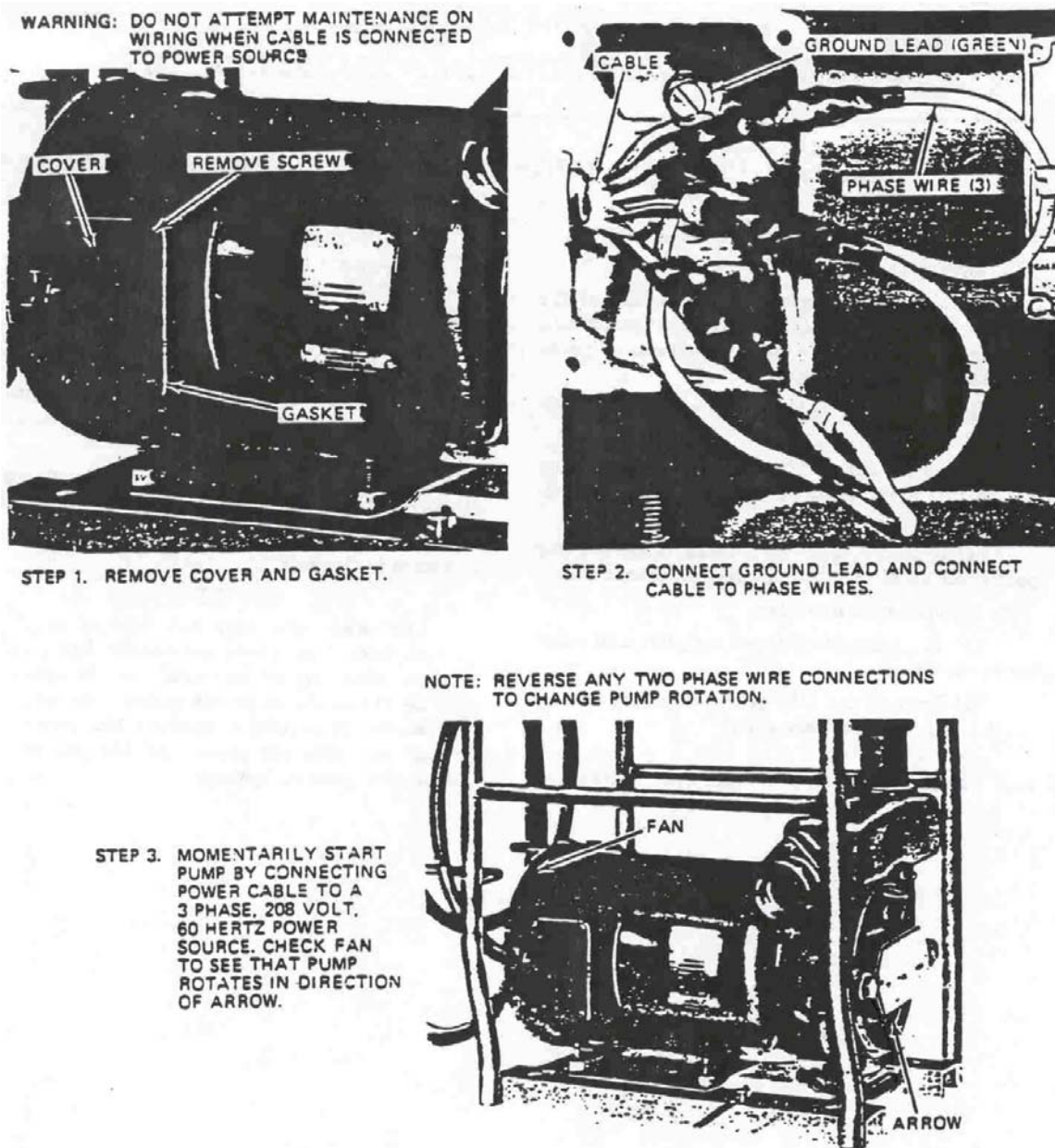


Figure 6.3

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d. If the large pin socket of the power source receptacle is not connected to the power source ground system, install a ground lead not smaller than No. AWG 6 copper wire.

e. Connect the other end of the ground lead to the closest ground system, and underground metallic water piping system or the steel frame of a building.

MOVEMENT TO A NEW WORKSITE

6.23. Dismantling for Movement.

a. Disconnect the hose lines from the flange adapters.

b. Cover the suction and discharge flange adapters to protect the threads and prevent foreign material from entering the pump.

c. Disconnect the ground lead from the terminal lug.

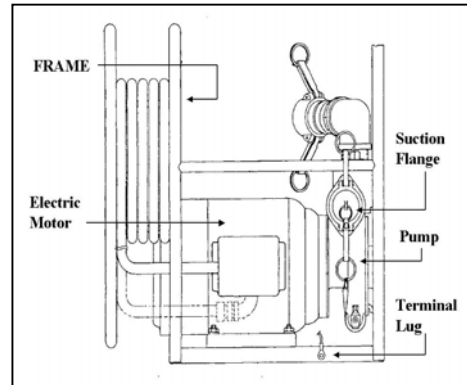


Figure 6-4

6-24. Reinstallation After Movement.

Refer to paragraph 6.22 and reinstall the pump unit.

REPAIR PARTS, SPECIAL TOOLS, AND EQUIPMENT

6.25. Tools and Equipment.

a. Basic tools and repair parts issued with, or authorized for the pumping unit are listed later in this chapter.

b. Organizational personnel for maintenance of the pumping unit require no special tools or equipment.

6.26. Organizational Maintenance Repair Parts.

Repair parts and equipment are listed and illustrated in the repair parts and special tools list covering organizational maintenance for this equipment later in this chapter.

LUBRICATION INSTRUCTIONS

6.27. The electric motor powered pump has been pre-lubricated at the factory and requires no specific lubrication.

Water Distribution and Wastewater Management System (WDWWMS)

PREVENTATIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

6.28. General.

To insure that the pumping units are ready for operations at all times, they must be systematically inspected so that defects may be discovered and corrected before they result in serious damage or failure. The necessary PMCS to be performed are listed in paragraph 6.29. All deficiencies and shortcomings will

be recorded together with the corrective action taken on DA Form 2404 (Equipment Inspection and Maintenance Worksheet).

6.29. Preventative Maintenance Checks and Services.

Refer to table 6.3 for the applicable PMCS.

Table 6.3. Preventative Maintenance Checks and Services (PMCS)

M – Monthly		Q- Quarterly
Interval Sequence No.		Item to be Inspected Procedure
M	Q	
1	10	APPEARANCE OF EQUIPMENT Clean entire unit with clear water, rinse, and dry.
2	11	ELECTRICAL LINES AND CONNECTIONS Inspect lines for breaks and frayed insulation. Check for loose connections.
3	12	DRAINCOCK Check for leaks, improper operation, or other damage.
4	13	ELECTRIC MOTOR FAN GUARD Inspect for dirt, foreign matter and damage. The openings of the fan guard shall be clean and free of foreign matter and shall show no damage.
5	14	ELECTRIC MOTOR Check to see that the motor is securely mounted. The exterior surface of the motor should be clean, free of dust, dirt, grease, and fungus. All connections and terminals shall be secure.
6	15	HARDWARE Check that all hardware is secure and tight.

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Table 6.3. Preventative Maintenance Checks and Services (PMCS) (continued)

M – Monthly		Q- Quarterly
Interval Sequence No.		Item to be Inspected Procedure
M	Q	
7	16	PUMP BODY Inspect for cracks, leaks, or other damage. The exterior surface should be clean, free of dust, dirt, grease, and fungus.
8	17	PUMP UNIT Inspect the entire unit for operational damage. Check each component for wear or damage.
9	18	SUCTION VALVE Check the suction valve for proper operation and leaks.

TROUBLESHOOTING

6.30.General.

This section provides information useful in diagnosing and correcting unsatisfactory performance or failure of the pumping units and components.

6.31. Troubleshooting.

Refer to table 6.4 for trouble shooting procedures.

Table 6.4. Troubleshooting

Malfunction

Test or Inspection

Corrective Action

ELECTRIC MOTOR

1. ELECTRIC MOTOR FAILS TO FUNCTION PROPERLY.

Step 1. Check for loose or corroded wiring connections.

Tighten loose connects at electric motor and ground. Clean corroded connections.

Water Distribution and Wastewater Management System (WDWWMS)

Table 6.4. Troubleshooting (continued)

Malfunction

Test or Inspection

Corrective Action

ELECTRIC MOTOR (continued)

1. ELECTRIC MOTOR FAILS TO FUNCTION PROPERLY.

Step 2. Check for correct connection of phase wires.

Reverse phase wires in accordance with paragraph 4-3.

Step 3. Check for defective motor.

If phase wires, ground and power source are wired correctly but the motor does not function properly, replace the motor.

2. ELECTRIC MOTOR OVERHEATS.

Step 1. Check power source voltage.

If the power source is too low, too high, or unbalanced, connect the electric motor to a proper power source.

Step 2. Check motor for binding.

If the motor has any restrictive rotation, replace the motor.

PUMP

3. PUMP FAILS TO FUNCTION PROPERLY.

Check to see if air is entering the pump body through loose connections.

Tighten loose connections and be certain hoses have no leaks.

4. PUMP LEAKS DURING OPERATION.

Inspect for any visible leakage near seals or suction valve.

Any evidence of leakage, notify general support.

5. NO WATER OR INSUFFICIENT WATER OUTLET PRESSURE.

Step 1. Ascertain if pump is primed.

Prime pump.

Step 2. Inspect suction line for clogging.

Remove the suction line, clean clogged area and replace on unit.

Step 3. Excessive suction lift.

Locate pump closer to liquid.

Step 4. Air leaks on suction side of pump.

Correct air leaks.

MAINTENANCE OF PUMP

6.32. Centrifugal Pump Assembly.

a. The centrifugal pump is driven by the electric motor. The pump is designed to pump water at the rate of 65 GPM (gallons per minute) at 50 ft-tdh (feet-total dynamic head).

b. Removal.

(1) Remove the cover plate shoulder bolts. Remove cover plate from the pump body.

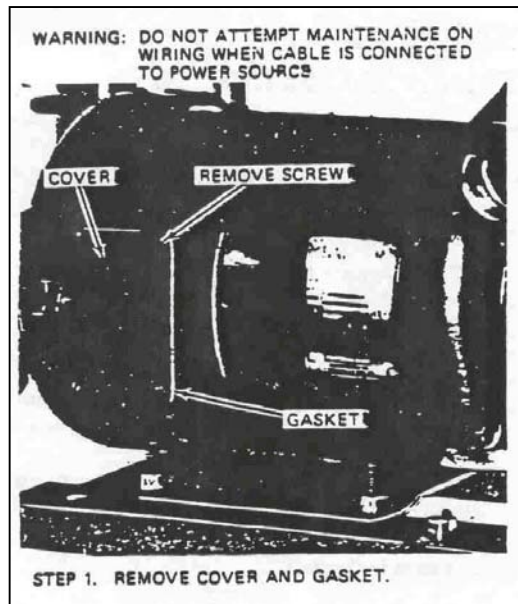


Figure 6.5

Step 1 – Remove Cover Plate and Pre-Formed Packing

NOTE REMOVE KEY FROM ENGINE SHAFT

(2) Remove impeller cap screw and remove impeller and key from the shaft adapter.



Figure 6.6

Step 2 – Remove the Impeller

NOTE: WHEN INSTALLING IMPELLER, LOOSEN SET SCREW AND ADJUST PEELER-TO-IMPELLER CLEARANCE TO 0.005-0.015 INCH

(3) Remove wear-plate-retaining screws and remove wear-plate. Remove shims, shaft adapter, and one-half of the seal assembly. Remove key from motor shaft.



Figure 6.7

Step 3 – Remove Wear Plate, Shims, Shaft Adapter and 1/2 of Seal Assembly

NOTE: MAINTAIN IMPELLER-TO-WEAR PLATE CLEARANCE OF 0.010-0.015 INCH BY USING SHIMS AS REQUIRED

(4) Remove pump mounting bolts and separate pump from motor.

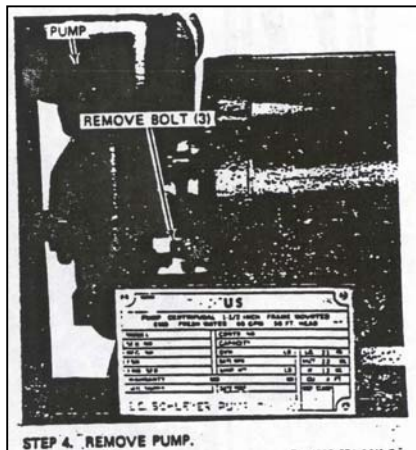


Figure 6.8

Step 4 – Remove Pump

6.33 Electric Motor Assembly.

a. Removal.

(1) Remove the centrifugal pump (paragraph 6.32.b).

(2) Remove the power cable as shown in figure 6.3.

(3) Refer to figure 6.6 and remove the four nuts and cap screws securing the motor to the frame.

b. Installation.

(1) Position the motor on the frame and secure with four cap screws and nuts.

(2) Install the power cable as shown in figure 6.3.

(3) Install the centrifugal pump per instructions in paragraph 6.32.

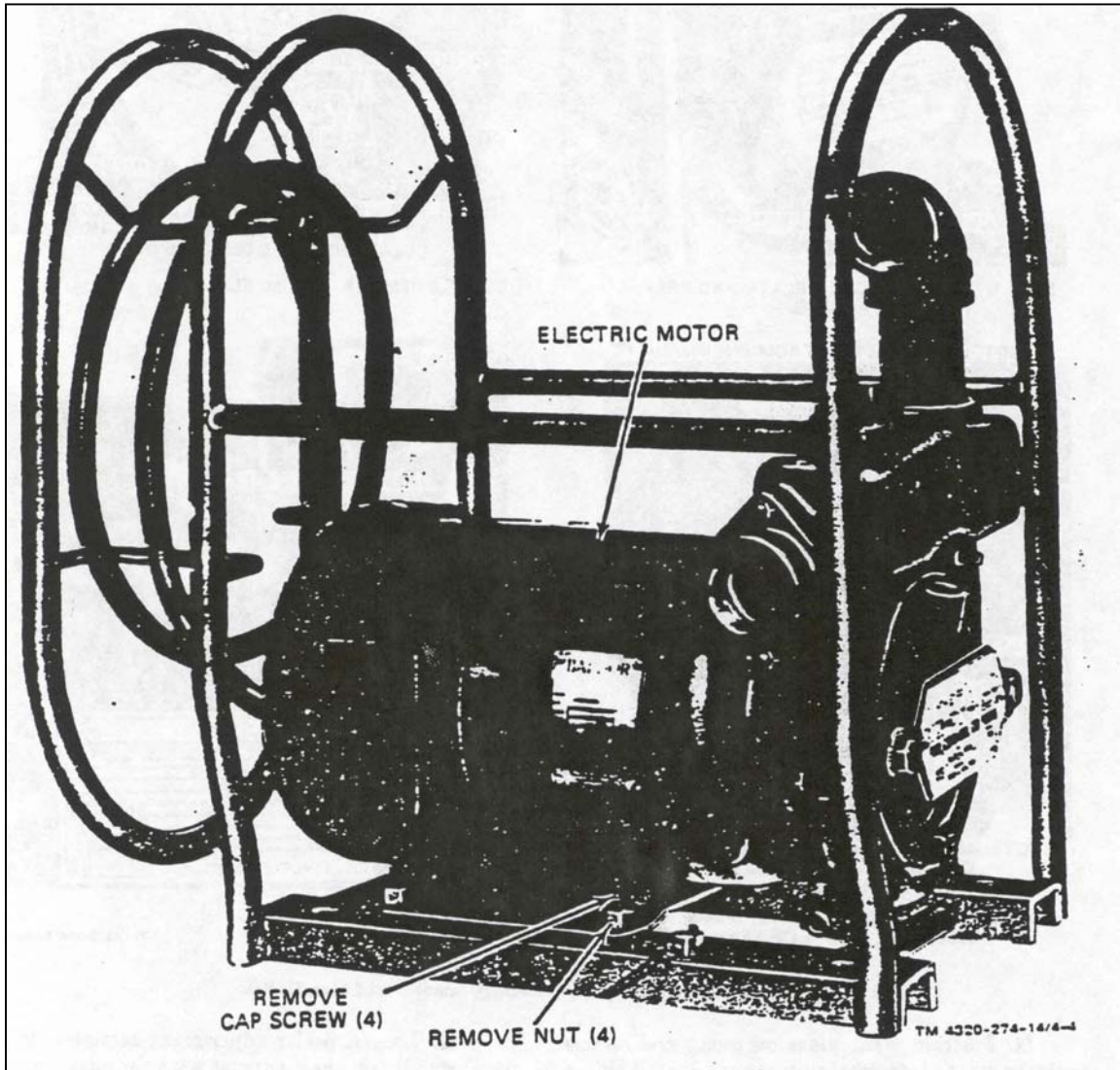


Figure 6.8. Electric motor assembly, removal and installation.

6.34. Frame.

a. General. The frame is of welded steel construction and designed to permit easy handling.

b. Remove.

(1) Remove the electric motor assembly (paragraph 6.33.a).

(2) With the pump and motor removed, the frame is free of components.

c. Installation. Install the motor and pump (paragraph 6.33.b).

**DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
INSTRUCTIONS**

REPAIR PARTS, SPECIAL TOOLS, AND EQUIPMENT

6-35 Special Tools and Equipment

No special tools or equipment are required by direct support or general support to maintain the pump unit.

6-36 Maintenance Repair Parts

Repair parts and equipment are listed and illustrated in the repair parts and special tools list covering direct support and general support maintenance for this equipment.

TROUBLESHOOTING

6.37.General

This section provides information useful in diagnosing and correcting unsatisfactory performance or failure of the pumping assembly or any of its components. Malfunctions which may

occur are listed in Table 6.5.

6.38.Troubleshooting

Refer to table 6.5 for troubleshooting data.

Table 6.5. Troubleshooting

Malfunction
Test or Inspection
Corrective Action

PUMP

1. PUMP FAILS TO FUNCTION PROPERLY.

- Step 1.* Inspect impeller for damage or wear.
If damage or wear is apparent, replace impeller.
 - Step 2.* Inspect adapter shaft and keys for damage.
If damage is apparent, replace damaged parts.
 - Step 3.* Inspect the wear plate for worn areas.
If wear is obvious, replace the wear plate.
 - Step 4.* Check peeler for proper clearance.
Adjust peeler (paragraph 6-5).
 - Step 5.* Check clearance of impeller-to-wear plate.
Adjust impeller-to-wear plate (paragraph 6-5).
-

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Table 6.5. Troubleshooting (continued)

Malfunction

Test or Inspection

Corrective Action

2. PUMP OPERATES WITH EXCESSIVE NOISE.

- Step 1.* Inspect for loose, broken or damaged impeller.
Tighten loose impeller; replace damaged impeller.
- Step 2.* Inspect for defective seal.
If defect is obvious, replace seal.
- Step 3.* Check peeler for proper clearance.
Adjust peeler (paragraph 6-5).

3. PUMP LEAKS

- Step 1.* Inspect check valve gasket for damage.
Replace damaged check valve gasket.
- Step 2.* Inspect seal for damage.
If damaged, replace seal.
- Step 3.* Inspect suction valve for damage.
If damaged, replace.

4. PUMP WILL NOT OPERATE

- Step 1.* Check main power source for defective fuse and/or circuit breaker.
Replace fuse and/or reset circuit breaker.
- Step 2.* Inspect for frozen or damaged impeller.
Loosen or replace the impeller and inspect for proper clearance.

ELECTRIC MOTOR

1. ELECTRIC MOTOR OVERHEATS

- Step 1.* Inspect for defective bearings.
Replace defective bearings (paragraph 6-11).
- Step 2.* Inspect and test for faulty stator windings.
Replace defective stator (paragraph 6-11).

2. ELECTRIC MOTOR VIBRATES

- Step 1.* Inspect for defective or broken fan.
If defects are apparent, replace fan (paragraph 6-11).
 - Step 2.* Inspect for defective bearings.
Replace defective bearings (paragraph 6-11).
 - Step 3.* Inspect for warped rotor shaft.
If warped, replace rotor (paragraph 6-11).
-

Water Distribution and Wastewater Management System (WDWWMS)

Table 6.5. Troubleshooting (continued)

Malfunction

Test or Inspection

Corrective Action

3. ELECTRIC MOTOR FAILS TO START

Step 1. Check for defective bearings.

If defective, replace bearings (paragraph 6-11).

Step 2. Inspect and test for faulty stator windings.

Replace defective stator (paragraph 6-11).

Step 3. Inspect for defective rotor.

If defective, replace rotor (paragraph 6-11).

4. POWER LEAKAGE IN ELECTRIC MOTOR.

Step 1. Inspect for defective bearings.

Replace bearings (paragraph 6-11).

Step 2. Inspect and test rotor and stator.

If defective, replace rotor and stator (paragraph 6-11).

GENERAL MAINTENANCE

6.39. Electric Motor Testing.

WARNING
Do not attempt maintenance on the motor when electrical cable is connected to the power source.

a. Preparation. Disconnect the power cable shown in figure 6.3.

b. Testing.

(1) Using a suitable test circuit, test for continuity between each of the motor phase wires. Replace the motor if the lamp does not light. Test for grounds between one motor phase (any one) wire and the frame. If the lamp is lit, replace the motor.

(2) Use a megohmmeter and measure the insulation resistance of the stator assembly as instructed in TM 5-764 (Electric Motor and Generator Repair). The insulation resistance should not be less than 0.25 megohms.

(3) Connect the electric motor leads to a balanced voltage source of 3-phase, 60-hertz, 208-volt power. Operate the motor under its normal load and measure the amperage in each motor lead with a hook-type ammeter. The amperage in the three leads should be equal and not more than 6-3 amperes per lead. Measure the shaft speed with a tachometer. The speed should not be less than 3,450 rpm (revolutions per minute).

REPAIR INSTRUCTIONS

CENTRIFUGAL PUMP ASSEMBLY

6.40. Pump Removal.

a. Refer to figure 4-3 and remove the cover plate shoulder bolts. Remove cover plate from the pump body.

b. Remove impeller cap screw and washer; remove impeller and key from the shaft adapter.

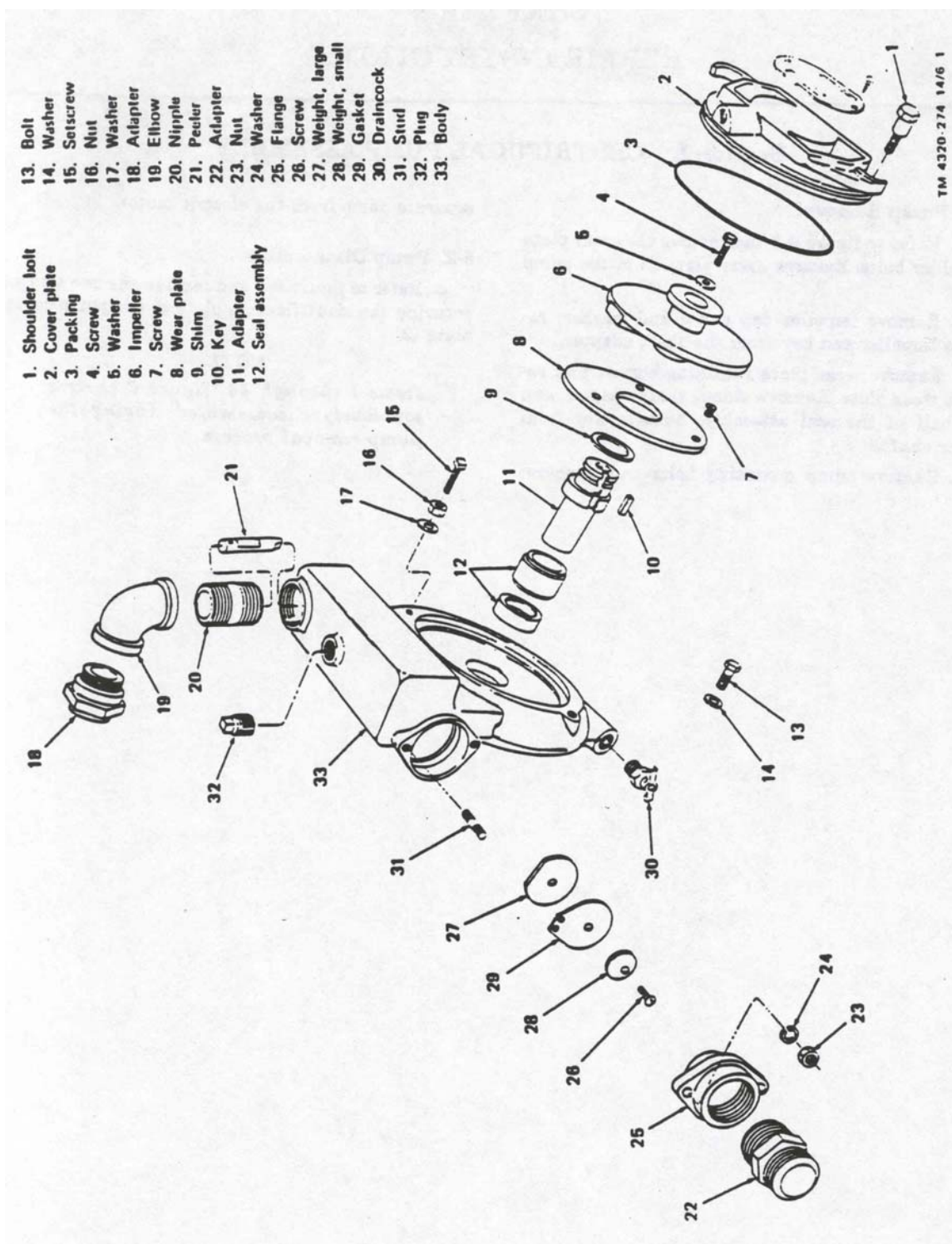
c. Remove wear plate retaining screws and remove wear plate. Remove shims, shaft adapter, and one-half of the seal assembly. Remove key from motor shaft.

d. Remove pump mounting bolts and washers; separate pump from the electric motor.

6.41. Pump Disassembly.

a. Refer to figure 6.9 and remove the two screws securing the identification plate to the pump cover plate (2).

NOTE
Items 1 through 14 (figure 6.9) were previously disassembled during the pump removal process.



(Figure 6.9. Centrifugal pump assembly, disassembly and re-assembly.

b. Remove setscrew (15), nut (16), and washer (17) from the pump body.

c. Remove adapter (18); elbow (19), nipple (20), and peeler (21) from the pump body.

d. Remove adapter (22) from the flange (25). Remove two nuts (23) and washers (24), and separate flange (25) from the pump body.

e. Remove screw (26) and separate weights (27 and 28) from the check valve gasket (29).

CAUTION
Do not pry with a sharp instrument as gasket may be damaged.

f. Remove draincock (39), studs (31), and plug (32) from the pump body (33).

6.42. Pump Cleaning and Inspection.

a. Clean pump body with pressurized water, spraying interior and exterior. Allow to dry thoroughly.

WARNING
Dry cleaning solvent, Specification P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F. (38°C.).

b. Clean pump connections thoroughly. Use dry cleaning solvent, Specification P-D-680, on metal parts. Dry components thoroughly.

c. Inspect all parts for cracks, excessive wear, damage, or deterioration. Replace defective parts.

6.44. Pump Reassembly.

a. Refer to figure 6.5 and install plug (32), studs (31) and draincock (30) on the pump body (33).

b. Position gasket (29) so that hinge end is up. Make sure that large weight (27) is on the pump side of the gasket. With small weight (28) positioned on the opposite side of the gasket, install the check valve gasket with screw (26).

c. Install flange (25) on pump body and secure with washers (24) and nuts (23). Install adapter (22) on the flange.

d. Install peeler (21), nipple (20), elbow (19) and adapter (18) on the pump body.

e. Position identification plate on the pump cover plate (2) and secure with screws. The remaining components will be assembled when the pump is installed.

6.45. Pump Installation.

a. Refer to figure 6.3 and position the pump body on the electric motor. Secure with the three pump mounting bolts and washers. Install remaining half of the seal assembly, and the shaft adapter, on the motor shaft using the motor shaft key.

b. Position wear plate on

pump and secure with the wear plate retaining screws. Install shims as required to maintain wear plate-to-impeller clearance of 0.010 to 0.015 inch.

c. Loosen peeler adjustment setscrew. Position impeller on shaft adapter with adapter key. Adjust setscrew to obtain peeler-to-impeller clearance of 0.005 to 0.015 inches. Secure impeller cap screw and washer.

c. Position cover plate on pump body and secure with the cover plate shoulder bolts.

a. Install the unit in accordance with paragraph 4-3 being certain that the suction and discharge hoses and fittings are the same nominal size as the suction and discharge ports of the pump.

b. Under the above conditions the pump shall perform as follows:

(1) Prime in not more than 133 seconds.

(2) Deliver not less than 58.5 gpm at a total head of 45 feet.

(3) Deliver not less than 45 gpm at a total head of 63 feet.

6.46. Pump Test

ELECTRIC MOTOR ASSEMBLY

6.47. Motor Removal

a. Remove the centrifugal pump (paragraph 6.1).

b. Disconnect the motor power cable shown in figure 6.3.

c. Refer to figure 6.6 and remove the four nuts, washers, and screws securing the motor to the frame.

(1)

a. Refer to figure 6.10 and remove screws (1), conduit box (2), and gasket (3) from the conduit box.

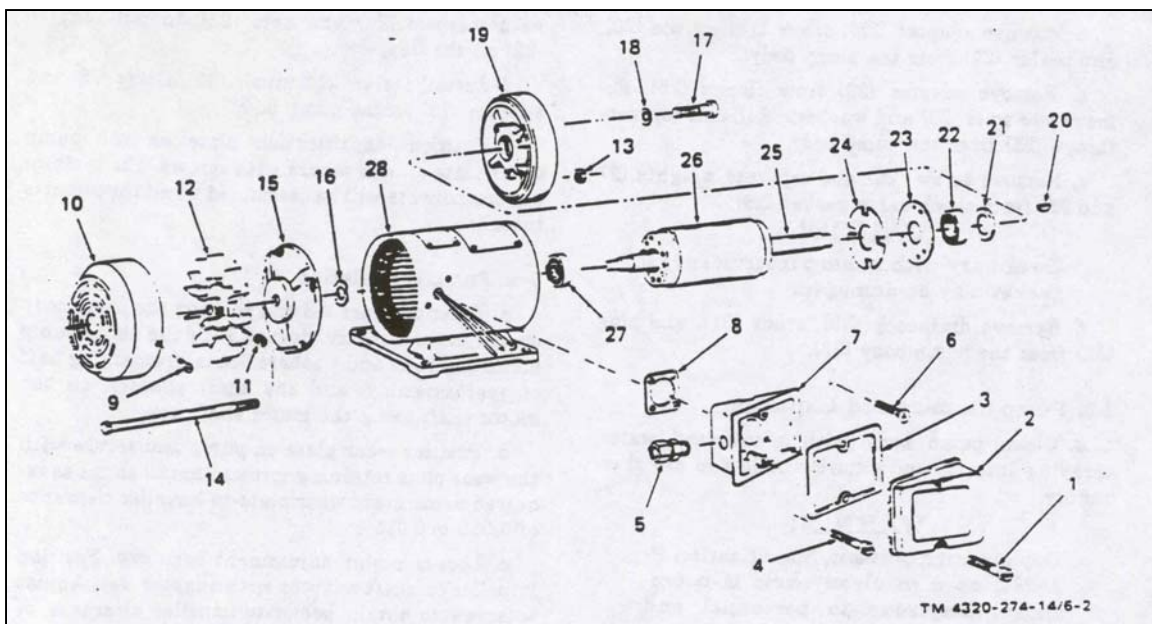


Figure 6.,10. Electric motor, disassembly and reassembly.

b. Remove gland screw (4) and cable gland (5) from the conduit box. Remove screws (6), conduit box (7), and the conduit box gasket (8) from the motor housing.

c. Remove screw (9) and fan guard (19) from the motor shaft.

d. Remove nuts (13), bolts (14), and end shield (15) from the motor housing. Remove spring washer (16) from the end shield.

e. Remove bolts (17), washers (18), and end shield (19) from the motor housing. Remove key (20), shaft sleeve (21), bearing (22), bearing retainer (23), and internal fan (24) from the shaft. Remove bearing (27) from the opposite end of the shaft.

(1) Motor Cleaning, Inspection, and Testing

WARNING

Dry cleaning solvent, Specification P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F. (38°C.).

a. Clean all parts using dry cleaning solvent, Specification P-D-680, and dry thoroughly.

b. Inspect all parts for cracks, excessive wear, damage, or deterioration.

c. Use an inside growler and test the stator assembly for shorted coils as instructed in TM 5-764 (Electric Motor and Generator Repair). Place the rotor assembly on an external growler and test for open circuits (see TM 5-864).

d. Replace all damaged or defective parts.

Water Distribution and Wastewater Management System (WDWWMS)

(2) Motor Rewind Data

The following rewind data is furnished in the event it is necessary to rewind the stator.

a. Stator

- (3) Number of poles2
- (4) Number of coils36
- (5) Number of slots36
- (6) Turns per coil13
turns of (2) No. 19 AWG
conductors in parallel
- (7) Coil span1-14
- (8) Wire SizeNo 19 AWG
- (9) Type of wire .Type T,
heavy Polythermalex,
coated round copper
magnet wire per MIL-W-
583A

b. Insulation materials:

- (1) Slot cell .. 5-5-5 DMD-
100 (36 pcs.)
- (2) Slot phase separator
3-3-3- DMD-100 (36 pcs.)
- (3) Slot wedge ... 5-5-5
DMD-100 (36 pcs.)
- (4) Phase group separator ...
0.007 Polyester glass sheet
(12 pcs.)
- (5) Dipping compound ...
Type AN, grade CB, clear
baking varnish, per MIL-
V-1137A, P.D. George
No. 2106, Class F.

d. Dipping and baking procedure:

- (1) Preheat to 225°F
(107°C)
- (2) Dip in baking varnish
until bubbling ceases.

- (3) Bake at 240°F
(116°C) for four
hours.

- (4) Redip in baking
varnish until bubbling
ceases.

- (5) Bake at 240°F
(116°C) for eight
hours.

- (6) Spray with air dry
varnish and air dry.

(10) Motor

Reassembly.

a. Install rotor assembly (26), figure 6-2) on shaft (25). Install bearing (27), internal fan (24), bearing retainer (23), bearing (22), shaft sleeve (21), and key (20) on shaft.

b. Slide assembled rotor shaft through end shield (19) and install bolts (17) and washers (18). Install opposite end of rotor shaft through stator and install spring washer (16). Install end shield (15), bolts (14), and nuts (13).

c. Position fan (12) on rotor shaft and install setscrew (11). Install fan guard (19) on motor housing and fasten with screw (9).

d. Position conduit box gasket (8) and conduit box (7) on the motor housing and install the retaining screws (6). Install cable gland (5) and gland screw (4) on the conduit box. Install gasket (3), conduit box cover (2), and screws (1).

**(11) Motor
Installation**

a. Refer to figure 6.6 and position the motor on the frame. Install

the four screws, washers, and nuts.

b. Connect the electrical power cable per instructions contained in figure 6.3.

c. Install the centrifugal pump (paragraph 6.45).

ADMINISTRATIVE STORAGE

6.48. Preparation of Equipment for Shipment

a. General. Detailed instructions for the preparation of the pumping unit for domestic shipment are outlined within this section. Preservation will be accomplished in sequence that will not require the operation of previously preserved components.

b. Inspection. The pumping unit will be inspected for any unusual conditions such as damage, rusting, accumulation of water, and pilferage. Inspection of the individual components and assemblies will be as outlined in Preventative Maintenance Checks and Services (PMCS), paragraph 6.18 of this chapter.

c. Cleaning and Drying. Clean all surfaces of the pumping unit with approved cleaning solvent and dry thoroughly.

d. Painting. Remove rust and corrosion from areas to be painted by sanding. Paint the exposed and sanded surfaces.

e. Depreservation Guide. DA Form 2258 (Depreservation Guide for Vehicles and Equipment).

(1) A properly annotated depreservation guide will be completed concurrently with preservation of each item of mechanical equipment. Any peculiar requirements will be outlined in the blank space on the form. The completed depreservation guide will be

placed with the equipment in a waterproof envelop marked "Depreservation Guide", and fastened in a conspicuous location on or near the operator's controls.

(2) Prior to placing equipment in operation or to the extent necessary for inspection, depreservation of the item will be performed as outlined in the depreservation guide.

f. Marking. The markings will conform to MIL-STD-129.

g. Power Cable. The power cable will be disconnected, coiled, and tied securely to the metal frame.

h. Basis Issue Items. All basic issue items will be packed with the publications in MILVAN with the pumping unit.

6.49. Loading Equipment for Shipment.

The pumping units are not heavy but it is recommended that two or more personnel lift the pump unit into the MILVAN.

6.50. Preparation of Equipment for Limited Storage.

a. Detailed instructions for preparation of the pumping unit for limited storage are provided in TM 740-90-1. Limited storage is defined as storage not to exceed six months.

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b. The pumping units should be stored in the Water Distribution Set MILVAN.

6.51. Inspection and Maintenance of Equipment in Limited Storage.

Every 90 days, the pumping units will be inspected as outlined in “Preventative Maintenance Checks and Services (PMCS). Quarterly”. After each inspection period, the pumping unit will be re-preserved as outlined in TM 740-90-1.

MAINTENANCE ALLOCATION CHART

INTRODUCTION

6.52. General.

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. This designates overall responsibility for the performance of maintenance functions on the identified end item or component and the work measurement time required to perform the functions by the designated maintenance level. The implementation of maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

b. *Column 2, Component/Assembly.* This column contains the noun names of components, assemblies, subassemblies and modules for which maintenance is authorized.

c. *Column 3, Maintenance Functions.* This column lists the functions to be performed on the item listed in Column 2. The maintenance functions are defined as follows:

(1) *Inspect.* To determine serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

6.53. Explanation of Columns

a. *Column 1, Group Number.* Column 1 lists the group numbers to identify related components, assemblies, subassemblies, and modules with their next higher assembly. The applicable groups are listed in the MAC in disassembly sequence beginning with the first group removed.

Water Distribution and Wastewater Management System (WDWWMS)

MAINTENANCE ALLOCATION CHART

FOR

Pump Centrifugal: Frame Mounted, 1½ inch, MIL-P-14514 Type I, Electric Motor Driven (E. C. Schleyer Model 4M-SE2000)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Category *					(5) Tools and Equipmemnt
			C	O	F	H	D	
01	FRAME ASSEMBLY							
0101	Frame and Miscellaneous Hardware	Inspect Replace	0.1 1.0					
02	ACCESSORY ITEMS							
0200	Cable Assembly, Electric	Inspect Replace	0.1 0.5					
	Data Plates	Inspect Replace	0.1 1.0					
03	ELECTRIC MOTOR ASSEMBLY							
0300	Motor Assembly	Inspect Test Replace Repair Overhaul	0.1 0.5 2.0 3.0 4.0					
04	PUMP ASSEMBLY							
0400	Pump	Inspect Test Replace Repair Overhaul	0.2 2.0 3.0 4.0					

* SUBCOLUMNS ARE AS FOLLOWS: C-OPERATOR/CREW O-ORGANIZATIONAL
F-DIRECT SUPPORT H-GENERAL SUPPORT D=DEPOT

** INDICATES WT/MH REQUIRED

**ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT
MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST**

The Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List can be found at Appendix C, TM 5-4320-274-14&P.

Chapter 7 WASTEWATER MANAGEMENT SETS (WWMS)

7-1. Introduction

a. This chapter describes the basic components of the Wastewater Management Sets (WWMS). The combination of hoses, fittings, gauges and valves provides maximum flexibility in setting up the sets. This flexibility will enable you to set up the sets in almost any configuration that will accommodate the hospital's mission.

b. The Wastewater Management Sets come in three configurations depending on the type of Combat Support Hospital to which it is authorized.

- Wastewater Management Set, Hospital, DEPMEDS (MF2K)
- Wastewater Management Set, MRI, 84 Bed (CORPS)
- Wastewater Management Set, MRI, 164 Bed (CORPS)

The components of these three configurations are identical, the only difference is the number of components authorized.

c. The reason for having a WWMS is to collect and later dispose of hospital wastewater in a safe manner. In addition, it aids in the control of infectious and communicable diseases.

d. In the practice of safe hygiene, it is essential to maintain complete separation of the Water Distribution Set and the WWMS.

7-2. Components

a. *Coupling Halves.* The Universal Quick Disconnect (or coupling half) is made of galvanized steel and incorporates a rubber gasket to provide a watertight seal when the halves are connected. Two coupling halves will allow the connection of:

(1) two hoses,

(2) a hose and the Pump Assembly, Diaphragm (NSN: 4320-01-440-7388),

(3) a hose and a Valve, Ball (NSN: 4820-01-440-5916)

(4) a hose and a Wye, Quick Disconnect (NSN: 4730-00-496-5952)

With two exceptions, all connections in the WWMS use universal quick disconnect. The two exceptions are

- Sink Drain Adapter
- Hose Assembly, Rubber used with the Field Sinks and the Ultrasonic Cleaners.

b. *Water Storage Tanks.* Units are authorized the following types and quantities of water storage tanks. The tanks are designed for the holding of wastewater until it can be evacuated from the site.

Types

- LIN T12938 – Tank Fabric, Collapsible, 20,000 Gallon Capacity

Water Distribution and Wastewater Management System (WDWWMS)

- LIN TBD, Tank Fabric, Collapsible, 5,000 Gallon Capacity
- LIN T19033 – Tank, Fabric, Collapsible, 3,000 Gallon Capacity

Requirements

	T12938	TBD	T19033
	20K Gal	5K Gal	3K Gal
MF2K	1	0	1
MRI 84	0	1	0
MRI 164	1	0	0

c. *Hose Assembly*. All hoses in the WWMS are black in color. These hoses are not used for any purpose other than wastewater evacuation. Each hose assembly has a universal quick disconnect at each end. Do not use black hose to replace or repair any potable water (sand color) hose. Hoses in the set are:

Hose Assembly, Rubber
NSN: 4730-01-434-9638
PN: 13230E5746-4
(1½ inch x 50 feet)

Hose Assembly, Rubber
NSN: 4730-01-434-9594
PN: 13229E7223-2
(1 inch x 10 feet)
Hose Assembly, Rubber
NSN: 4730-01-434-9605
PN: 13229E7223-3
(1 inch x 20 feet)

Hose Assembly, Rubber
NSN: 6545-01-434-9646
PN: 13229E7223-1
(1 inch x 5 feet)

Hose Assembly, Rubber
NSN: 6545-01-434-9649
PN: 13229E7223-4
(1 inch x 50 feet)

d. *Adapter, Sink*. (NSN: 6545-01-434-9630, PN: 13229E7224) The sink adapter consists of a pipe to hose adapter, a reducing pipe coupling, and a universal quick disconnect coupling half.

e. *Hose Assembly, Rubber (Field Sink Drain Hose Assembly)*. (NSN: 6545-01-434-9627, PN: 13229E7226) This assembly consists of a section of black hose with a hose coupling assembly on one end and a universal quick disconnect coupling half on the other end. This assembly replaces the existing drain hose on field sinks. The hose assembly is also used to drain the ultrasonic cleaner.

f. *Stand Assembly, Distribution Nozzle*. (NSN: 4930-01-120-7426, PN: 13225E9140) The Stand Assembly is a collapsible steel tripod. It has chains attached to the legs to prevent them from opening too far. Each leg has a hook at the top to hang the Funnel Assembly.

g. *Funnel Assembly*. (NSN: 6545-01-434-9587, PN: 13229E7229) The Funnel Assembly consists of a large black funnel with a screen fitted inside, a universal quick disconnect coupling half secured to a discharge tube, and three hooks for hanging the funnel from the Stand Assembly, Distribution Nozzle.

WARNING

The Water Distribution Nozzle and the Waste Funnel Assembly should not be suspended from the same Stand Assembly. This could result in contamination of the water system. Use one Stand Assembly for the nozzle and one Stand Assembly for the Funnel Assembly.

h. *Valve, Ball.* (NSN: 4820-01-440-5916, PN: 13225E7225) This valve provides a means to close off the WWMS. It is used near the funnel and stand assemblies.

i. *Cage, Wire Folding.* This cage is designed for the storage of hoses and components.

7-3. Principles of Installation.

The information in this chapter provides guidance to help plan the physical layout for the hospital. Obtain a scale drawing or diagram of the deployed hospital and sketch the layout of the Water Distribution Set and the WWMS on this diagram. Depending on the size and configuration of the hospital, plan on at least one primary loop, and if weather conditions warrant, the use of one or more secondary loop(s).

a. *Location of Wastewater Collection Site.* The collection site is the most important factors in setting up the WWMS. The terrain as well as the plans of the Unit Commander will dictate placement and the type of collection site(s).

- The collection site must be at least 300 feet (100 yards) from the hospital boundary.

- It should must not be located on higher terrain that the freshwater tank(s). Position the collection site in an area lower than the rest of the hospital and away from the fresh water tank(s). This will aid the pump in drawing the wastewater and, if a leak occurs, prevent the wastewater from contaminating the other areas of the hospital complex.

- Sufficient space needs to be allocated to ensure waste water does not overflow into areas where its presence would be undesirable.

- Allow space for wastewater evacuation vehicles access to the waste water tank(s).

CAUTION

The Wastewater Collection Site MUST be at least 300 feet (100 yards) from the hospital boundary, and should never be on a higher terrain level than than the freshwater tank(s).

b. *Location of Pumps.* Locate pumps on each loop, close to the collection site. Note that the power cable on the pump is 40 feet long. **DO NOT USE AN EXTENSION CORD.** Elevate electrical connections (plugs, etc.) on wooden blocks above areas where puddles may form. The pump provided [Pump Assembly, Diaphragm, NSN: 4320-01-440-7388, PN: 13229E7222] is driven by a single-phase 115 volt, 60 Hertz electric motor. The motor should be supplied by a dedicated branch circuit protected by a fuse or circuit breaker rated at no more than 15 amps.

c. *Location of Sinks and Water Distribution Connections.* The WWMS collects waste water from sinks and drain funnels. The location of Water Distribution Set components will determine the layout of the WWMS hoses and receptacles. They should be located to preclude cross-contamination of the potable water.

d. *Location of Hose Protection Channels.* Hoses should not cross vehicle routes. Hoses crossing pedestrian paths should be kept to a minimum. If a hose must cross a TEMPER, do so at a passageway, and use a hose protection channel. Where possible, allow waste and fresh water hoses to share a hose protection channel.

Chapter 8
WASTEWATER MANAGEMENT SET (WWMS)
Medical Force 2000 (MF2K) 296 Bed Configuration
Operator Instructions, PMCS, and Repair Instructions

8-1. Introduction

a. This set is part of the Water Distribution and Wastewater Management System (WDWWMS), DEPMEDS, MF2K. For brevity in this chapter, the wastewater management set will be identified as a WWMS.

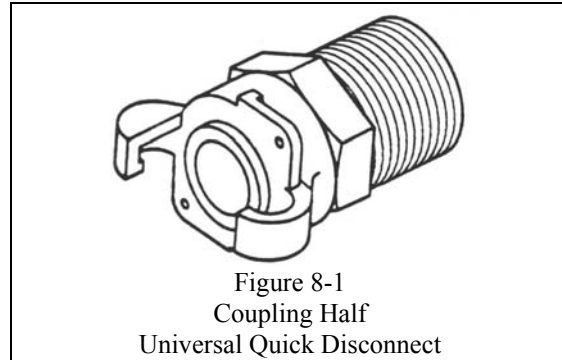
b. This chapter describes the assembly, operation and disassembly of the WWMS. This set allows for the evacuation of wastewater generated by hospitals up to 296 beds.

c. The reason for having a WWMS is to collect and later dispose of hospital wastewater in a safe manner. In addition, it aids in the control of infectious and communicable diseases.

d. In the practice of safe hygiene, it is essential to maintain complete separation of the Water Distribution Set and the WWMS.

8-2. Components

a. *Coupling Halves.* The Universal Quick Disconnect (or coupling half) is made of galvanized steel and incorporates a rubber gasket to provide a watertight seal when the halves are connected. Two coupling halves will allow the connection of:



(1) two hoses,

(2) a hose and the Pump Assembly, Diaphragm (NSN: 4320-01-440-7388),

(3) a hose and a Valve, Ball (NSN: 4820-01-440-5916)

(4) a hose and a Wye, Quick Disconnect (NSN: 4730-00-496-5952)

With two exceptions, all connections in the WWMS use universal quick disconnect. The two exceptions are

- Sink Drain Adapter
- Hose Assembly, Rubber used with the Field Sinks and the Ultrasonic Cleaners.

Water Distribution and Wastewater Management System (WDWWMS)

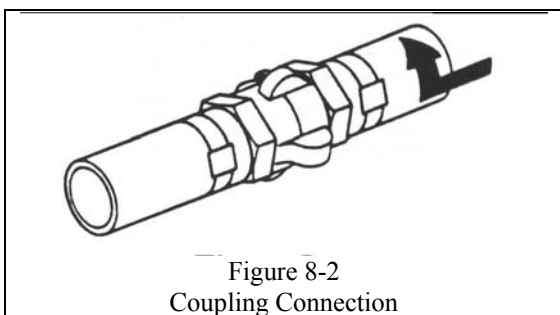


Figure 8-2
Coupling Connection

b. *Water Storage Tanks.* Units are authorized the following types and quantities of water storage tanks.

Types

- LIN T12938 – Tank Fabric, Collapsible, 20,000 Gallon Capacity



Figure 8-3
Tank Fabric Collapsible, 20,000 Gallon
Laid Out on Ground

- LIN TBD – Tank, Fabric, Collapsible, 5,000 Gallon Capacity
- LIN T19033 – Tank, Fabric, Collapsible, 3,000 Gallon Capacity

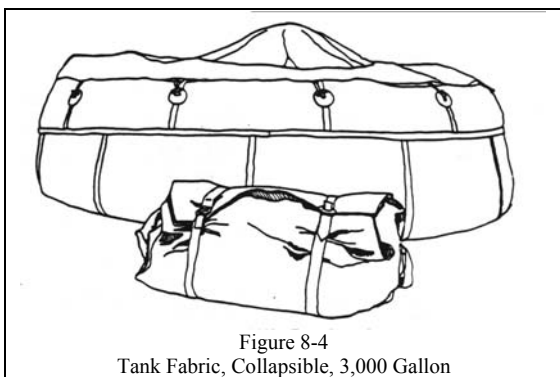


Figure 8-4
Tank Fabric, Collapsible, 3,000 Gallon

Requirements

	T12938	T19033
	20K Gal	3K Gal
MF2K	1	1

c. *Hose Assembly.* All hoses in the WWMS are black in color. These hoses are not used for any purpose other than wastewater evacuation. Each hose assembly has a universal quick disconnect at each end. Do not use black hose to replace or repair any potable water (sand color) hose. Hoses in the set are:

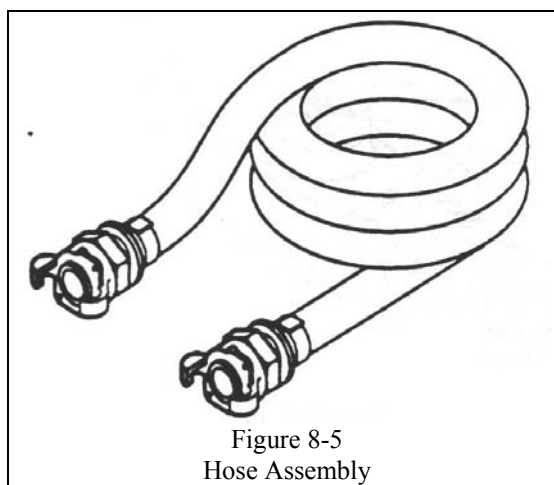


Figure 8-5
Hose Assembly

Hose Assembly, Rubber
NSN: 4730-01-434-9638
PN: 13230E5746-4
(1½ inch x 50 feet)

Hose Assembly, Rubber
NSN: 4730-01-434-9594
PN: 13229E7223-2
(1 inch x 10 feet)

Hose Assembly, Rubber
NSN: 4730-01-434-9605
PN: 13229E7223-3
(1 inch x 20 feet)

Water Distribution and Wastewater Management System (WDWWMS)

Hose Assembly, Rubber
NSN: 6545-01-434-9646
PN: 13229E7223-1
(1 inch x 5 feet)

Hose Assembly, Rubber
NSN: 6545-01-434-9649
PN: 13229E7223-4
(1 inch x 50 feet)

d. *Adapter, Sink.* (NSN: 6545-01-434-9630, PN: 13229E7224) The sink adapter consists of a pipe to hose adapter, a reducing pipe coupling, and a universal quick disconnect coupling half.

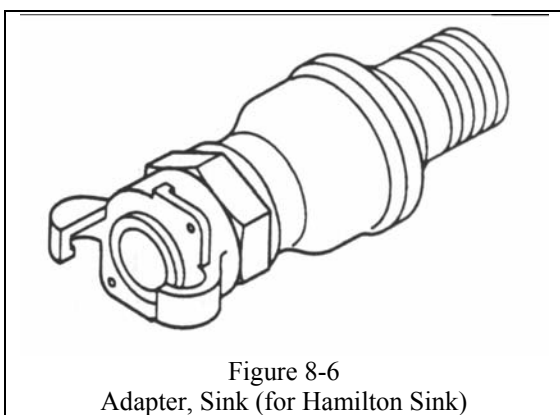


Figure 8-6
Adapter, Sink (for Hamilton Sink)

e. *Hose Assembly, Rubber (Field Sink Drain Hose Assembly).* (NSN: 6545-01-434-9627, PN: 13229E7226) This assembly consists of a section of black hose with a hose coupling assembly on one end and a universal quick disconnect coupling half

on the other end. This assembly replaces the existing drain hose on field sinks. The hose assembly is also used to drain the ultrasonic cleaner.

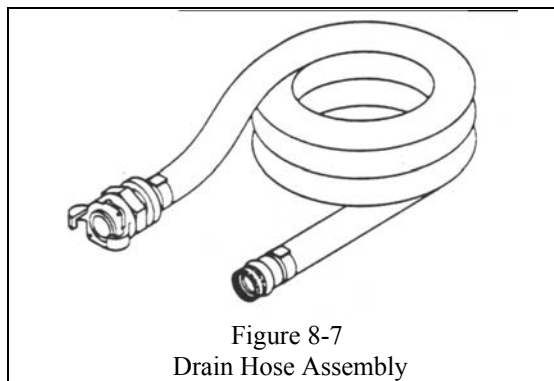


Figure 8-7
Drain Hose Assembly

f. *Stand Assembly, Distribution Nozzle.* (NSN: 4930-01-120-7426, PN: 13225E9140) The Stand Assembly is a collapsible steel tripod. It has chains attached to the legs to prevent them from opening too far. Each leg has a hook at the top to hang the Funnel Assembly.

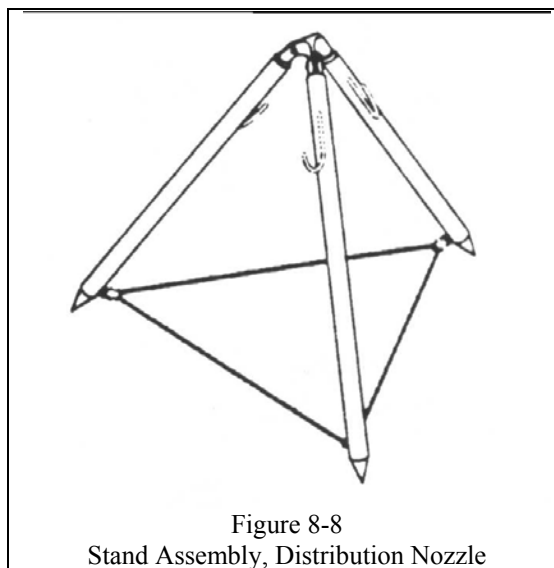
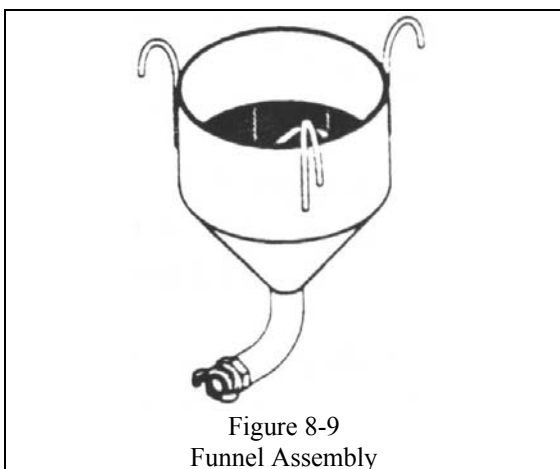


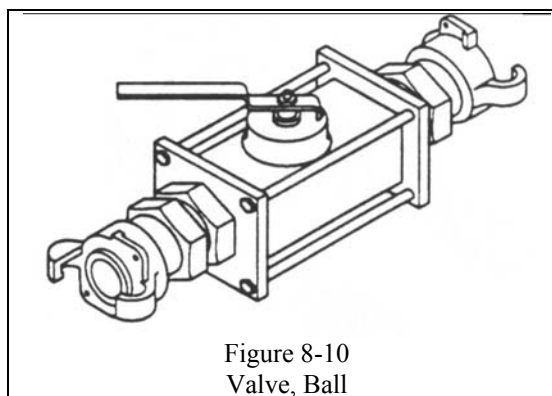
Figure 8-8
Stand Assembly, Distribution Nozzle

g. *Funnel Assembly.* (NSN: 6545-01-434-9587, PN: 13229E7229) The Funnel Assembly consists of a large black funnel with a screen fitted inside, a universal quick disconnect coupling half secured to a discharge tube, and three hooks for hanging the funnel from the Stand Assembly, Distribution Nozzle.



WARNING
The Water Distribution Nozzle and the Waste Funnel Assembly should not be suspended from the same Stand Assembly. This could result in contamination of the water system. Use one Stand Assembly for the nozzle and one Stand Assembly for the Funnel Assembly.

h. *Valve, Ball.* (NSN: 4820-01-440-5916, PN: 13225E7225) The ball valve provides a means to close off the WWMS. It is used near the funnel and stand assemblies.



i. *Cage, Wire, Folding.* The cage is designed for the storage of hoses and fittings.



8-3. Principles of Installation.

The information in this chapter provides guidance to help plan the physical layout for the hospital. Obtain a scale drawing or diagram of the deployed hospital and sketch the layout of the Water Distribution Set and the WWMS on this diagram. Depending on the size and configuration of the hospital, plan on at least one primary loop, and if weather conditions warrant, the use of one or more secondary loops.

a. *Location of Wastewater Collection Site.* The collection site is the most important factors in setting up the WWMS. The terrain as well as the plans of the Unit Commander will dictate placement and the type of collection site(s).

- The collection site must be at least 300 feet (100 yards) from the hospital boundary.

- It should must not be located on higher terrain that the freshwater tank(s). Position the collection site in an area lower than the rest of the hospital and away from the fresh water tank(s). This will aid the pump in drawing the wastewater and, if a leak occurs, prevent the wastewater from contaminating the other areas of the hospital complex.

- Sufficient space needs to be allocated to ensure waste water does not overflow into areas where its presence would be undesirable.

- Allow space for wastewater evacuation vehicles access to the waste water tank(s).

WARNING

The Wastewater Collection Site MUST be at least 300 feet (100 yards) from the hospital boundary, and should never be on a higher terrain level than the freshwater tank(s).

b. *Location of Pumps.* Locate pumps on each loop, close to the collection site. Note that the power cable on the pump is 40 feet long. **DO NOT USE AN EXTENSION CORD.** Elevate electrical connections (plugs, etc.) on wooden blocks above areas where puddles may form. The pump provided [Pump Assembly, Diaphragm, NSN: 4320-01-440-7388, PN: 13229E7222] is driven by a single-phase 115 volt, 60 Hertz electric motor. The motor should be supplied by a dedicated branch circuit protected by a fuse or circuit breaker rated at no more than 15 amps.

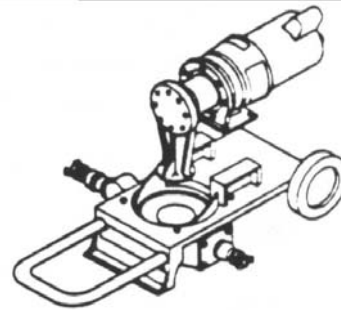


Figure 8-12
Pump

c. *Location of Sinks and Water Distribution Connections.* The WWMS collects waste water from sinks and drain funnels. The location of Water Distribution Set components will determine the layout of the WWMS hoses and receptacles. They should be located to preclude cross-contamination of the potable water.

d. *Location of Hose Protection Channels.* Hoses should not cross vehicle routes. Hoses crossing pedestrian paths should be kept to a minimum. If a hose must cross a TEMPER, do so at a passageway, and use a hose protection channel. Where possible, allow waste and fresh water hoses to share a hose protection channel.

8-4. Assembly.

a. This paragraph provides some general guidelines and some rules on how to assemble the WWMS. Be prepared to alter the initial plan of the WWMS to be compatible with the Water Distribution Set and to accommodate movement or addition of sinks, funnels, or collection sites, and to reduce excessively long hose runs.

b. Use the sketch of the WWMS layout and position the funnel assemblies. Make all sink and funnel assembly connections. Place the ball valve assembly on the funnel assembly directly or immediately after a 5 foot section of hose. Ensure that all sink drains are plugged and all ball valve assemblies are closed. Add hose assembly sections as necessary to exit structures.

c. The Adapter, Sink (NSN: 6545-01-434-9630, PN: 13229E7224) is forced into the flexible pipe extension of a Hamilton Sink. The universal quick disconnect coupling half is connected to the WWMS.

WARNING
To avoid possible contamination, wastewater hose assemblies should never be stored with fresh water hose assemblies. Waste hoses should not be allowed to drip or discharge wastewater onto components of the Water Distribution system.

d. Remove the existing field sink drain hose by unscrewing the $\frac{3}{4}$ inch hose coupling assembly under the sink. Replace it with the Hose Assembly, Rubber (NSN: 6545-01-434-9627, PN: 13229E7226). Following connection the universal quick disconnect coupling half is connected to the WWMS.

e. Starting at the sink drain and funnel hose assemblies, lay out the hose sections to connect to the trunk lines. Lay out the trunk lines and determine where the Wye, Quick Disconnect (NSN: 4730-00-496-5952, PN: WW-C-633-M) will be required. Connect all hose assemblies, using the Wye fittings, where necessary, to complete the system.

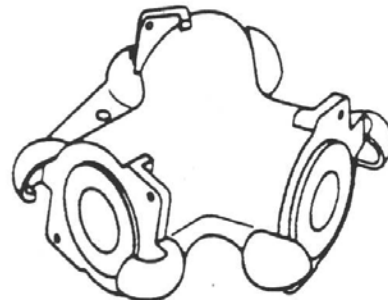


Figure 8-13
Wye, Quick Disconnect

CAUTION

Be sure to check the condition of the gaskets on the hose fittings as you assemble the hoses. Do not drag the hose, you will damage the hose and the fittings.

CAUTION

During installation of the pipe adapters, do not screw the pipe nipple more than 5/8 inch into the discharge port of the Pump Assembly, Diaphragm.

CAUTION

To ensure proper seating of the fittings, remove all burrs from the fittings using a file (located in the WDWMS Maintenance Set).

CAUTION

On the Pump Assembly, Diaphragm, be sure to remove the breather filler plug seal before operation. Using pliers to remove, pull the 1-inch long “spaghetti” shaped plastic from the hole drilled horizontally through the breather plug.

WARNING

To avoid injury, limit the amount of hose carried by one person.

CAUTION

The Pump Assembly, Diaphragm should be located at the lowest practical elevation and as close to the evacuation site as possible.

f. Connect a 5 foot piece of hose to the funnel and connect the Valve, Ball (NSN: 4820-01-440-5916, PN: 13225E7225) to the 5 foot hose.

g. Position the Pump Assembly, Diaphragm (NSN: 4320-01-440-7388, PN: 13229E7222) as close to the collection site as possible. Long hose runs on the discharge side reduce the pump's capacity.

NOTE: Prior to EVERY setup and use, the operator/maintainer is required to install a reducing coupling and a universal quick disconnect coupling half to the intake side of the pump (it has male threads). The discharge side of the pump has female threads and requires the installation of a 4 inch pipe nipple, a reducing coupling and a universal quick disconnect coupling half.

CAUTION

If possible, avoid allowing debris to enter the system. The Pump and Hose Assemblies are capable of passing some solids, however, inducing solids into the system should be avoided.

h. Connect the Pump Assembly, Diaphragm to an approved power source. While the Water Distribution system is being flushed, turn on the pump. Observe the system to ensure that there are no leaks and that the pump is working on both intake (suction) and discharge sides. Check tightness of each

connection by pouring about one gallon of water into the drain of each sink and funnel to ensure that there are no leaks and that the pump is working properly.

8-5. Operation

a. Monitor the hose assemblies for leaks in the fittings and in the hose.

b. Monitor the evacuation site for leaks and spills. This system is designed to provide collection of the wastewater for evacuation from the site. Coordinate with Preventive Medicine personnel within the Theater to periodically neutralize the collected waste water and evacuate the material from the hospital site for further treatment or disposal.

c. Inspection of the pump.

On a daily basis.

(1) Check the valves. If the discharge valve does not seat properly, vacuum lift is lost. If the intake valve does not seal, pump efficiency will be lost.

(2) Check the diaphragm for leaks and wear.

(3) Grease the eccentric drive daily with 4 to 6 strokes of a grease gun.

CAUTION
Always keep the sink drains plugged when not actually draining water. Leaving them open will degrade the system and may burn out the Pump Assembly.

8-6. Disassembly

a. The procedures discussed enables you to disassemble the system in a manner that is both safe and efficient. The procedure is intended to be independent of any actions associated with the disassembly of the hospital. However, hose lines located inside a TEMPER must be removed before the tent can be disassembled.

WARNING
Use of non-sterile disposable rubber gloves is recommended when handling wet components of the WWMS. Contact Preventive Medicine personnel for further guidance on this subject.

b. Prior to disassembly of the WWMS, prepare at least 5 gallons of disinfectant solutions. The solution is made by mixing 16 ounces (approximately 2 cups) of household bleach (Sodium Hypochlorite, 0.525%) into 5 gallons of potable water. Use a 5 gallon "Jerry Can" for holding the disinfectant. The working solution is corrosive and will bleach items made of cloth and other liquid absorbing material. Take care not to spill the solution on clothing and boots.

c. Locate the sink or funnel at the most distant location of the medical facility. NOTE: there may be duplicate distant locations, so additional disinfectant should be prepared. With the system in normal operation, pour about one gallon of disinfectant into the plugged sink or funnel (closed ball valve). Allow the solution to sanitize the sink or funnel part for a minute, then

Water Distribution and Wastewater Management System (WDWWMS)

remove the sink plug or open the ball valve. Allow the disinfectant solution to be drawn into the WWMS hoses and to the collection tank.

d. Use the disinfectant solution for ALL sink and funnel locations. More disinfectant solution may be necessary to properly sanitize those components.

e. Shut down the pump when the sound changes (to appear that it pumping air instead of liquid) to indicate that ALL disinfectant solution has passed through the system and is now in the collection tank.

NOTE

Allow the pump to remove as much of the disinfectant solution as possible before disassembly.

f. Begin disassembly of the WWMS at the point farthest from the collection tank or where TEMPER must be taken down.

NOTE

As wastewater hoses become disconnected, realize that some liquid may be trapped within the hose. Take action to place the lowest point of hoses where they can drain without leakage on TEMPER flooring or on tent material.

g. Disconnect the hoses from the sink or funnel, one at a time. Ensure that recently disconnected hose is raised high enough so that any liquid will drain out.

CAUTION

When removing hoses from a TEMPER, use caution to ensure that the fittings do not damage the tent flooring.

h. Do not replace the field sink drain hose assemblies. The new drain hose assemblies installed as part of this system will remain with the field sinks. The old, unused drain hose assemblies may be stored with the equipment or handed to medical maintenance personnel.

i. Allow sufficient time for the hose assemblies and other components to dry out or otherwise reduce the liquid trapped in the hoses to manageable levels.

j. Separate the Wye fittings and the Hamilton Sink drain adapters for storage.

k. Collect all hose assemblies at the location of the Cage, Wire, Folding Place one end of a hose assembly against the inside wall of a cage. Feed the longer hoses into the cage first and work toward the center. Use the shorter pieces to fill in the voids in the center.

l. As much as possible, store similar fittings together.

m. Disconnect the pump from its power source and wind the cord around the handle. This will keep it from dragging when the pump is moved.

n. Remove the adapter fittings Installed on the suction and discharge chambers of the pump. Soak these

components in the sanitizing solution for at least one minute.

NOTE

On disassembly of the pump, remove the inlet and outlet fittings to prevent breaking the suction or discharge chamber castings.

o. Tilt the pump so that its suction chamber is up and the discharge chamber is aimed towards the ground. Pour one gallon of the sanitizing solution into the suction chamber and allow it to run out the discharge chamber. Do not let the liquid enter the pump motor.

p. Secure or tie the fittings, removed in step *i.* to the pump handle. This will keep them from becoming lost during transport or storage.

q. Physically look over the work area to ensure that no fittings or hose assemblies have been overlooked.

Prior to moving the WWMS, ensure that all components of the set are together. Use the inventory list to ensure that nothing is missing.

8-7. Preventive Maintenance. The following preventative checks and services should be done daily in addition to the operational checks detailed in paragraph 7-5, above. They should be done before storing or moving the system.

a. Pump. See Chapter 11.

b. Hose Assemblies. Check hoses for abrasions, cuts, or gouges. Check for:

(1) The presence of bulges in the hose or seepage at the hose fittings during operations.

(2) Inspect for rust and deterioration on coupling halves and clamps.

c. Funnel Assembly. Cleaning the screen requires removing the funnel from the stand assembly prior to removal of the screen. If an attempt is made to remove the screen before removing the funnel from the stand assembly, the screen may tilt. This action may allow large solid material to be introduced into the WWMS and could clog hoses or damage the pump. Clean funnel assembly with sanitizing solution.

8-8. Repair Procedures. The Water Distribution Set and the WWMS are supported by the Waste-Water Augmentation Set (WWAS) which includes components for expansion of the Water Distribution and WWMS. An additional set, the Water Distribution and Wastewater Maintenance Set contains an initial stockage of repair parts and tools necessary to maintain the system. Both sets are fielded with the system. As parts are replaced or used in support of the WDS and WWMS the user is responsible to replenish the components as needed.

a. Pump. See Chapter 11.

b. Broken, Torn or Punctured Hoses. The principle behind repairing damaged hose is to make two good hoses from one damaged hose..

(1) Use a hacksaw to cut the hose squarely and remove the damaged section. If the short section is 2 feet or

less, remove and retain the universal coupling if it is in useable condition. Dispose of hose pieces shorter than 2 feet.

NOTE

Wash hacksaw blade in a dilute bleach solution or hot soapy water after each use to prevent contamination of the hacksaw blade.

(2) Place a hose clamp (from the maintenance set) over the newly cut end.

(3) Insert a Universal Quick Disconnect Coupling Half in the cut end as far as it will go.

(4) Position the hose clamp near the body of the coupling half.

(5) Tighten the clamp and trim the excess metal strip. Excess metal that is not trimmed must be flattened against the clamp with a hammer. If there are sharp edges, remove them with a small file.

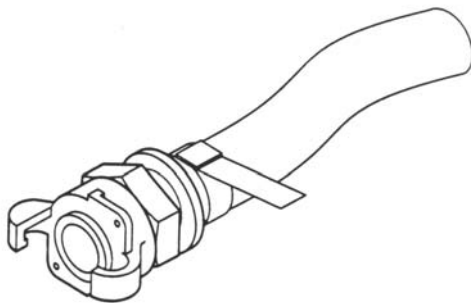


Figure 8-14
Hose Repair

NOTE

The cut ends of banding material are sharp enough to cause deep cuts and tear clothing. Use a file to dull or smooth the sharp edge. Use tape to cover the edge if necessary to prevent cuts during handling.

(6) Repeat steps (2) through (5) for the other piece of hose.

(7) Do not attempt to repair the Hose Assembly, Rubber (NSN: 6545-01-434-9627, PN: 13229E7226) hose if it breaks within 1 foot of the coupling assembly. Replace the entire assembly.

c. Universal Quick Disconnect, Coupling Half, Hose Fittings and Wye fittings. The only repair performed on these parts consists of replacement of the rubber gaskets. Cracked or broken fittings must be replaced.

Chapter 9

WASTEWATER MANAGEMENT SET (WWMS)

Medical Re-engineering Initiative (MRI) 84 Bed Configuration

Operator Instruction, PMCS, and Repair Instructions

9-1. Introduction

a. This set is part of the Water Distribution and Wastewater Management System (WDWWMS), DEPMEDS, MRI 84 Bed. For brevity in this chapter, the wastewater management set will be identified as a WWMS.

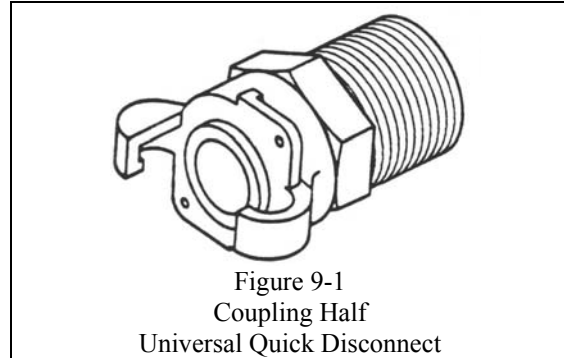
b. This chapter describes the assembly, operation and disassembly of the WWMS. This set allows for the evacuation of wastewater generated by hospitals up to 84 beds.

c. The reason for having a WWMS is to collect and later dispose of hospital wastewater in a safe manner. In addition, it aids in the control of infectious and communicable diseases.

d. In the practice of safe hygiene, it is essential to maintain complete separation of the Water Distribution Set and the WWMS.

9-2. Components

a. *Coupling Halves.* The Universal Quick Disconnect (or coupling half) is made of galvanized steel and incorporates a rubber gasket to provide a watertight seal when the halves are connected. Two coupling halves will allow the connection of:



(1) two hoses,

(2) a hose and the Pump Assembly, Diaphragm (NSN: 4320-01-440-7388),

(3) a hose and a Valve, Ball (NSN: 4820-01-440-5916)

(4) a hose and a Wye, Quick Disconnect (NSN: 4730-00-496-5952)

With two exceptions, all connections in the WWMS use universal quick disconnect. The two exceptions are

- Sink Drain Adapter
- Hose Assembly, Rubber used with the Field Sinks and the Ultrasonic Cleaners.

Water Distribution and Wastewater Management System (WDWWMS)



Figure 9-2
Coupling Connection

b. *Water Storage Tanks.* Units are authorized the following types and quantities of water storage tanks.

Types

- LIN TBD – Tank, Fabric, Collapsible, 5,000 Gallon Capacity

Requirements

	TBD
	5K Gal
MRI 84	1

c. *Hose Assembly.* All hoses in the WWMS are black in color. These hoses are not used for any purpose other than wastewater evacuation. Each hose assembly has a universal quick disconnect at each end. Do not use black hose to replace or repair any potable water (sand color) hose. Hoses in the set are:

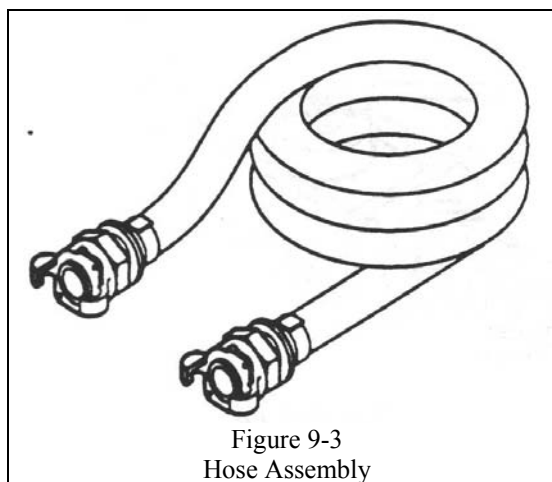


Figure 9-3
Hose Assembly

Hose Assembly, Rubber
NSN: 4730-01-434-9638
PN: 13230E5746-4
(1½ inch x 50 feet)

Hose Assembly, Rubber
NSN: 4730-01-434-9594
PN: 13229E7223-2
(1 inch x 10 feet)

Hose Assembly, Rubber
NSN: 4730-01-434-9605
PN: 13229E7223-3
(1 inch x 20 feet)

Hose Assembly, Rubber
NSN: 6545-01-434-9646
PN: 13229E7223-1
(1 inch x 5 feet)

Hose Assembly, Rubber
NSN: 6545-01-434-9649
PN: 13229E7223-4
(1 inch x 50 feet)

d. *Adapter, Sink.* (NSN: 6545-01-434-9630, PN: 13229E7224) The sink adapter consists of a pipe to hose adapter, a reducing pipe coupling, and a universal quick disconnect coupling half.

Water Distribution and Wastewater Management System (WDWMS)

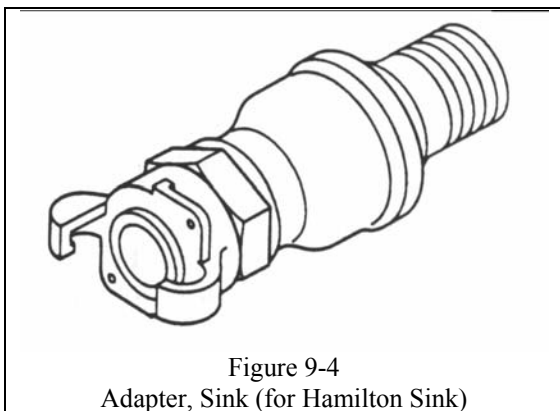


Figure 9-4
Adapter, Sink (for Hamilton Sink)

e. *Hose Assembly, Rubber (Field Sink Drain Hose Assembly).* (NSN: 6545-01-434-9627, PN: 13229E7226) This assembly consists of a section of black hose with a hose coupling assembly on one end and a universal quick disconnect coupling half on the other end. This assembly replaces the existing drain hose on field sinks. The hose assembly is also used to drain the ultrasonic cleaner.

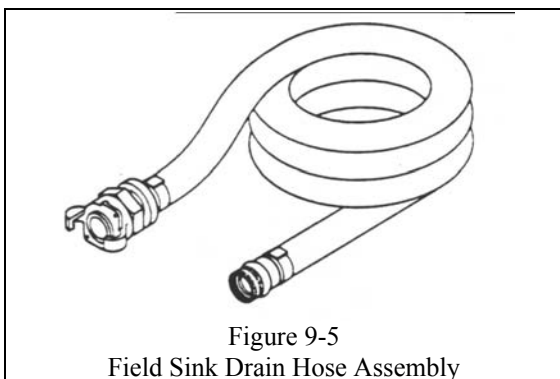


Figure 9-5
Field Sink Drain Hose Assembly

f. *Stand Assembly, Distribution Nozzle.* (NSN: 4930-01-120-7426, PN: 13225E9140) The Stand Assembly is a collapsible steel tripod. It has chains attached to the legs to prevent them from opening too far. Each leg has a hook at the top to hang the Funnel Assembly.

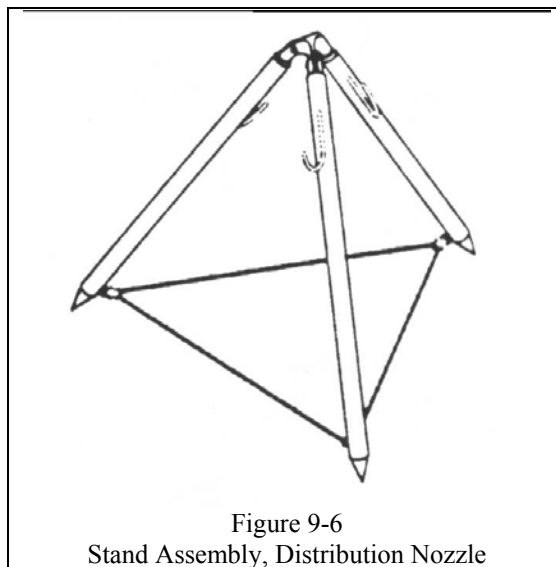


Figure 9-6
Stand Assembly, Distribution Nozzle

g. *Funnel Assembly.* (NSN: 6545-01-434-9587, PN: 13229E7229) The Funnel Assembly consists of a large black funnel with a screen fitted inside, a universal quick disconnect coupling half secured to a discharge tube, and three hooks for hanging the funnel from the Stand Assembly, Distribution Nozzle.

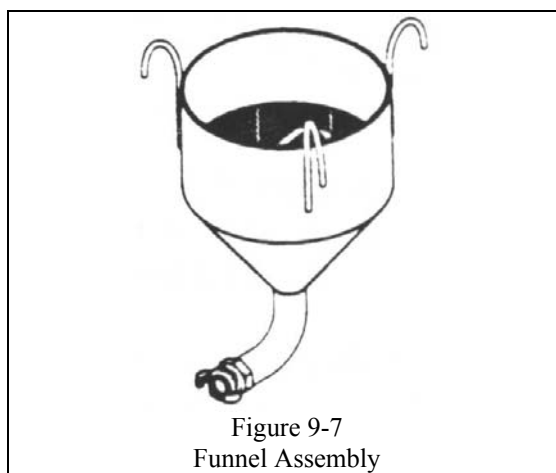
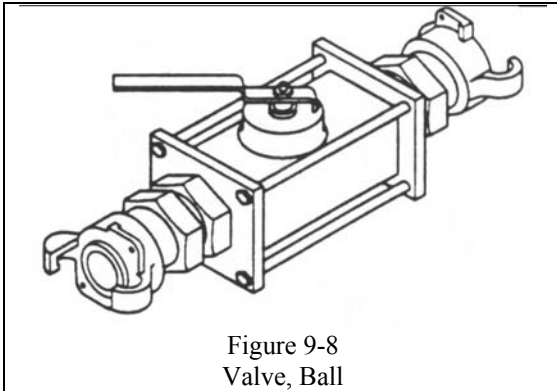


Figure 9-7
Funnel Assembly

WARNING

The Water Distribution Nozzle and the Waste Funnel Assembly should not be suspended from the same Stand Assembly. This could result in contamination of the water system. Use one Stand Assembly for the nozzle and one Stand Assembly for the Funnel Assembly.

h. *Valve, Ball.* (NSN: 4820-01-440-5916, PN: 13225E7225) The ball valve provides a means to close off the WWMS. It is used near the funnel and stand assemblies.



i. *Cage, Wire, Folding.* The cage is designed for the storage of hoses and fittings.



Figure 9-9
Cage, Wire, Folding

9-3. Principles of Installation.

The information in this chapter provides guidance to help plan the physical layout for the hospital. Obtain a scale drawing or diagram of the deployed hospital and sketch the layout of the Water Distribution Set and the WWMS on this diagram. Depending on the size and configuration of the hospital, plan on at least one primary loop, and if weather conditions warrant, the use of one or more secondary loops.

a. *Location of Wastewater Collection Site.* The collection site is the most important factors in setting up the WWMS. The terrain as well as the plans of the Unit Commander will dictate placement and the type of collection site(s).

- The collection site must be at least 300 feet (100 yards) from the hospital boundary.
- It should must not be located on higher terrain that the freshwater tank(s). Position the collection site in an area lower than the rest of the hospital and away from the fresh water tank(s).

Water Distribution and Wastewater Management System (WDWWMS)

This will aid the pump in drawing the wastewater and, if a leak occurs, prevent the wastewater from contaminating the other areas of the hospital complex.

- Sufficient space needs to be allocated to ensure waste water does not overflow into areas where its presence would be undesirable.
- Allow space for wastewater evacuation vehicles access to the waste water tank(s).

WARNING

The Wastewater Collection Site MUST be at least 300 feet (100 yards) from the hospital boundary, and should never be on a higher terrain level than the freshwater tank(s).

b. *Location of Pumps.* Locate pumps on each loop, close to the collection site. Note that the power cable on the pump is 40 feet long. **DO NOT USE AN EXTENSION CORD.** Elevate electrical connections (plugs, etc.) on wooden blocks above areas where puddles may form. The pump provided [Pump Assembly, Diaphragm, NSN: 4320-01-440-7388, PN: 13229E7222] is driven by a single-phase 115 volt, 60 Hertz electric motor. The motor should be supplied by a dedicated branch circuit protected by a fuse or circuit breaker rated at no more than 15 amps.

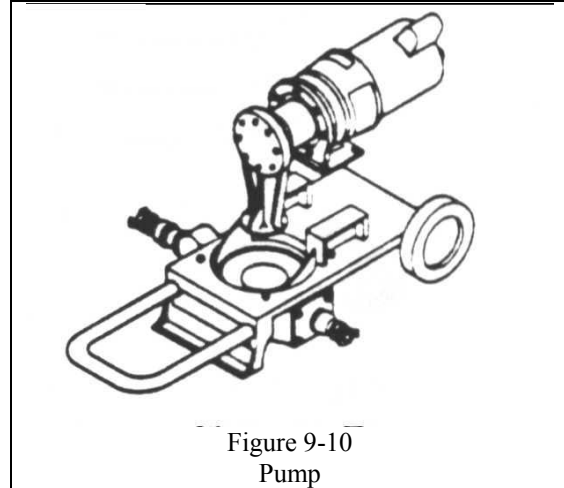


Figure 9-10
Pump

c. *Location of Sinks and Water Distribution Connections.* The WWMS collects waste water from sinks and drain funnels. The location of Water Distribution Set components will determine the layout of the WWMS hoses and receptacles. They should be located to preclude cross-contamination of the potable water.

d. *Location of Hose Protection Channels.* Hoses should not cross vehicle routes. Hoses crossing pedestrian paths should be kept to a minimum. If a hose must cross a TEMPER, do so at a passageway, and use a hose protection channel. Where possible, allow waste and fresh water hoses to share a hose protection channel.

9-4. Assembly.

a. This paragraph provides some general guidelines and some rules on how to assemble the WWMS. Be prepared to alter the initial plan of the WWMS to be compatible with the Water Distribution Set and to accommodate movement or addition of sinks, funnels, or collection sites, and to reduce excessively long hose runs.

Water Distribution and Wastewater Management System (WDWMS)

b. Use the sketch of the WWMS layout and position the funnel assemblies. Make all sink and funnel assembly connections. Place the ball valve assembly on the funnel assembly directly or immediately after a 5 foot section of hose. Ensure that all sink drains are plugged and all ball valve assemblies are closed. Add hose assembly sections as necessary to exit structures.

c. The Adapter, Sink (NSN: 6545-01-434-9630, PN: 13229E7224) is forced into the flexible pipe extension of a Hamilton Sink. The universal quick disconnect coupling half is connected to the WWMS.

WARNING
To avoid possible contamination, wastewater hose assemblies should never be stored with fresh water hose assemblies. Waste hoses should not be allowed to drip or discharge wastewater onto components of the Water Distribution system.

d. Remove the existing field sink drain hose by unscrewing the $\frac{3}{4}$ inch hose coupling assembly under the sink. Replace it with the Hose Assembly, Rubber (NSN: 6545-01-434-9627, PN: 13229E7226). Following connection the universal quick disconnect coupling half is connected to the WWMS.

e. Starting at the sink drain and funnel hose assemblies, lay out the hose sections to connect to the trunk lines. Lay out the trunk lines and determine where the Wye, Quick Disconnect (NSN: 4730-00-496-5952, PN: WW-C-633-M) will be required. Connect all

hose assemblies, using the Wye fittings, where necessary, to complete the system.

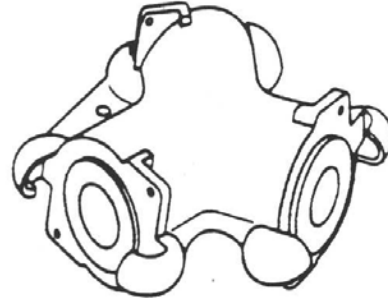


Figure 9-11
Wye, Quick Disconnect

CAUTION
Be sure to check the condition of the gaskets on the hose fittings as you assemble the hoses. Do not drag the hose, you will damage the hose and the fittings.

CAUTION
To ensure proper seating of the fittings, remove all burrs from the fittings using a file (located in the WDWMS Maintenance Set).

WARNING
To avoid injury, limit the amount of hose carried by one person.

f. Connect a 5 foot piece of hose to the funnel and connect the Valve, Ball (NSN: 4820-01-440-5916, PN: 13225E7225) to the 5 foot hose.

g. Position the Pump Assembly, Diaphragm (NSN: 4320-01-440-7388, PN: 13229E7222) as close to the collection site as possible. Long hose runs on the discharge side reduce the pump's capacity.

NOTE: Prior to EVERY setup and use, the operator/maintainer is required to install a reducing coupling and a universal quick disconnect coupling half to the intake side of the pump (it has male threads). The discharge side of the pump has female threads and requires the installation of a 4 inch pipe nipple, a reducing coupling and a universal quick disconnect coupling half.

CAUTION

During installation of the pipe adapters, do not screw the pipe nipple more than 5/8 inch into the discharge port of the Pump Assembly, Diaphragm.

CAUTION

On the Pump Assembly, Diaphragm, be sure to remove the breather filler plug seal before operation. Using pliers to remove, pull the 1 inch long "spaghetti" shaped plastic from the hole drilled horizontally through the breather plug.

CAUTION

The Pump Assembly, Diaphragm should be located at the lowest practical elevation and as close to the evacuation site as possible.

CAUTION

If possible, avoid allowing debris to enter the system. The Pump and Hose Assemblies are capable of passing some solids, however, inducing solids into the system should be avoided.

h. Connect the Pump Assembly, Diaphragm to an approved power source. While the Water Distribution system is being flushed, turn on the pump. Observe the system to ensure that there are no leaks and that the pump is working on both intake (suction) and discharge sides. Check tightness of each connection by pouring about one gallon of water into the drain of each sink and funnel to ensure that there are no leaks and that the pump is working properly.

9-5. Operation

a. Monitor the hose assemblies for leaks in the fittings and in the hose.

b. Monitor the evacuation site for leaks and spills. This system is designed to provide collection of the wastewater for evacuation from the site. Coordinate with Preventive Medicine personnel within the Theater to periodically neutralize the collected waste water and evacuate the material from the hospital site for further treatment or disposal.

c. Inspection of the pump.

On a daily basis.

(1) Check the valves. If the discharge valve does not seat properly, vacuum lift is lost. If the intake valve

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does not seal, pump efficiency will be lost.

(2) Check the diaphragm for leaks and wear.

(3) Grease the eccentric drive daily with 4 to 6 strokes of a grease gun.

CAUTION

Always keep the sink drains plugged when not actually draining water. Leaving them open will degrade the system and may burn out the Pump Assembly.

9-6. Disassembly

a. The procedures discussed enables you to disassemble the system in a manner that is both safe and efficient. The procedure is intended to be independent of any actions associated with the disassembly of the hospital. However, hose lines located inside a TEMPER must be removed before the tent can be disassembled.

WARNING

Use of non-sterile disposable rubber gloves is recommended when handling wet components of the WWMS. Contact Preventive Medicine personnel for further guidance on this subject.

b. Prior to disassembly of the WWMS, prepare at least 5 gallons of disinfectant solutions. The solution is made by mixing 16 ounces (approximately 2 cups) of household

bleach (Sodium Hypochlorite, 0.525%) into 5 gallons of potable water. Use a 5- gallon “Jerry Can” for holding the disinfectant. The working solution is corrosive and will bleach items made of cloth and other liquid absorbing material. Take care not to spill the solution on clothing and boots.

c. Locate the sink or funnel at the most distant location of the medical facility. NOTE: there may be duplicate distant locations, so additional disinfectant should be prepared. With the system in normal operation, pour about one gallon of disinfectant into the plugged sink or funnel (closed ball valve). Allow the solution to sanitize the sink or funnel part for a minute, then remove the sink plug or open the ball valve. Allow the disinfectant solution to be drawn into the WWMS hoses and to the collection tank.

d. Use the disinfectant solution for ALL sink and funnel locations. More disinfectant solution may be necessary to properly sanitize those components.

e. Shut down the pump when the sound changes (to appear that it pumping air instead of liquid) to indicate that ALL disinfectant solution has passed through the system and is now in the collection tank.

NOTE

Allow the pump to remove as much of the disinfectant solution as possible before disassembly.

f. Begin disassembly of the WWMS at the point farthest from the collection tank or where TEMPER must be taken down.

NOTE

As wastewater hoses become disconnected, realize that some liquid may be trapped within the hose. Take action to place the lowest point of hoses where they can drain without leakage on TEMPER flooring or on tent material.

g. Disconnect the hoses from the sink or funnel, one at a time. Ensure that recently disconnected hose is raised high enough so that any liquid will drain out.

CAUTION

When removing hoses from a TEMPER, use caution to ensure that the fittings do not damage the tent flooring.

h. Do not replace the field sink drain hose assemblies. The new drain hose assemblies, installed as part of this system will remain with the field sinks. The old, unused drain hose assemblies may be stored with the equipment or handed to medical maintenance personnel.

i. Allow sufficient time for the hose assemblies and other components to dry out or otherwise reduce the liquid trapped in the hoses to manageable levels.

j. Separate the Wye fittings and the Hamilton Sink drain adapters for storage.

k. Collect all hose assemblies at the location of the Cage, Wire, Folding.

l. As much as possible, store similar fittings together.

m. Disconnect the pump from its power source and wind the cord around the handle. This will keep it from dragging when the pump is moved.

n. Remove the adapter fittings installed on the suction and discharge chambers of the pump. Soak these components in the sanitizing solution for at least one minute.

NOTE

On disassembly of the pump, remove the inlet and outlet fittings to prevent breaking the suction or discharge chamber castings.

o. Tilt the pump so that its suction chamber is up and the discharge chamber is aimed towards the ground. Pour one gallon of the sanitizing solution into the suction chamber and allow it to run out the discharge chamber. Do not let the liquid enter the pump motor.

p. Secure or tie the fittings, removed in step *i.* to the pump handle. This will keep them from becoming lost during transport or storage.

q. Physically look over the work area to ensure that no fittings or hose assemblies have been overlooked.

Prior to moving the WWMS, ensure that all components of the set are together. Use the inventory list to ensure that nothing is missing.

9-7. Preventive Maintenance. The following preventative checks and

Water Distribution and Wastewater Management System (WDWWMS)

services should be done daily in addition to the operational checks detailed in paragraph 9-5, above. They should be done before storing or moving the system.

- a. Pump. See Chapter 11.
- b. Hose Assemblies. Check hoses for abrasions, cuts, or gouges. Check for:
 - (1) The presence of bulges in the hose or seepage at the hose fittings during operations.
 - (2) Inspect for rust and deterioration on coupling halves and clamps.
- c. Funnel Assembly. Cleaning the screen requires removing the funnel from the stand assembly prior to removal of the screen. If an attempt is made to remove the screen before removing the funnel from the stand assembly, the screen may tilt. This action may allow large solid material to be introduced into the WWMS and could clog hoses or damage the pump. Clean funnel assembly with sanitizing solution.

9-8. Repair Procedures. The Water Distribution Set and the WWMS are supported by the Water Distribution and Wastewater Management System Maintenance Set which contains an initial stockage of repair parts and tools necessary to maintain the system. This set is fielded with the system. As parts are replaced or used in support of the WDS and WWMS the user is responsible to replenish the components as needed.

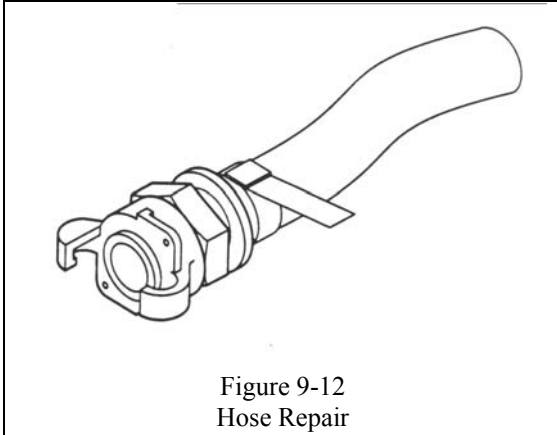
- a. Pump. See Chapter 11.
- b. Broken, Torn or Punctured Hoses. The principle behind repairing damaged hose is to make two good hoses from one damaged hose..

(1) Use a hacksaw to cut the hose squarely and remove the damaged section. If the short section is 2 feet or less, remove and retain the universal coupling if it is in useable condition. Dispose of hose pieces shorter than 2 feet.

NOTE

Wash hacksaw blade in a dilute bleach solution or hot soapy water after each use to prevent contamination of the hacksaw blade.

- (2) Place a hose clamp (from the maintenance set) over the newly cut end.
- (3) Insert a Universal Quick Disconnect Coupling Half in the cut end as far as it will go.
- (4) Position the hose clamp near the body of the coupling half.
- (5) Tighten the clamp and trim the excess metal strip. Excess metal that is not trimmed must be flattened against the clamp with a hammer. If there are sharp edges, remove them with a small file.



(7) Do not attempt to repair the Hose Assembly, Rubber (NSN: 6545-01-434-9627, PN: 13229E7226) hose if it breaks within 1 foot of the coupling assembly. Replace the entire assembly.

c. Universal Quick Disconnect, Coupling Half, Hose Fittings and Wye fittings. The only repair performed on these parts consists of replacement of the rubber gaskets. Cracked or broken fittings must be replaced.

NOTE

The cut ends of banding material are sharp enough to cause deep cuts and tear clothing. Use a file to dull or smooth the sharp edge. Use tape to cover the edge if necessary to prevent cuts during handling.

(6) Repeat steps (2) through (5) for the other piece of hose.

Chapter 10 WASTEWATER MANAGEMENT SET (WWMS) Medical Re-engineering Initiative (MRI) 164 Bed Configuration Operator Instructions, PMCS, and Repair Instructions

10-1. Introduction

a. This set is part of the Water Distribution and Wastewater Management System (WDWWMS), DEPMEDS, Medical Re-engineering Initiative (MRI) MRI 164 Bed. For brevity in this chapter, the wastewater management set will be identified as a WWMS MRI 164.

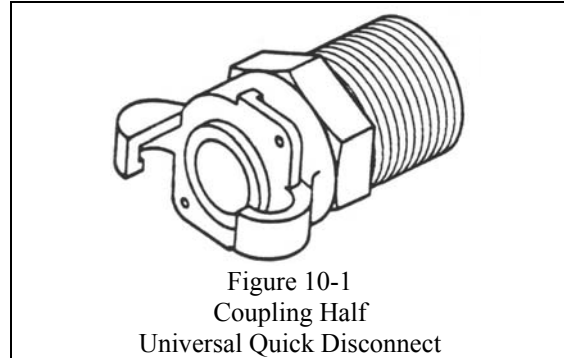
b. This chapter describes the assembly, operation and disassembly of the WWMS MRI 164. This set allows for the evacuation of wastewater generated by hospitals up to 164 beds.

c. The reason for having a WWMS MRI 164 is to collect and later dispose of hospital wastewater in a safe manner. In addition, it aids in the control of infectious and communicable diseases.

d. In the practice of safe hygiene, it is essential to maintain complete separation of the WDS MRI 164 and the WWMS MRI 164.

10-2. Components

a. *Coupling Halves.* The Universal Quick Disconnect (or coupling half) is made of galvanized steel and incorporates a rubber gasket to provide a watertight seal when the halves are connected. Two coupling halves will allow the connection of:



(1) two hoses,

(2) a hose and the Pump Assembly, Diaphragm (NSN: 4320-01-440-7388),

(3) a hose and a Valve, Ball (NSN: 4820-01-440-5916)

(4) a hose and a Wye, Quick Disconnect (NSN: 4730-00-496-5952)

With two exceptions, all connections in the WWMS MRI 164 use universal quick disconnect. The two exceptions are

- Sink Drain Adapter
- Hose Assembly, Rubber used with the Field Sinks and the Ultrasonic Cleaners.

Water Distribution and Wastewater Management System (WDWWMS)

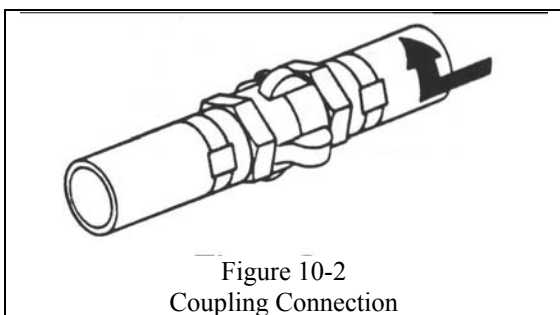


Figure 10-2
Coupling Connection

b. *Water Storage Tanks.* Units are authorized the following types and quantities of water storage tanks.

Types

- LIN T12938 – Tank Fabric, Collapsible, 20,000 Gallon Capacity



Figure 10-3
Tank Fabric Collapsible, 20,000 Gallon
Laid Out on Ground

Requirements

	T12938
20K Gal	1

c. *Hose Assembly.* All hoses in the WWMS are black in color. These hoses are not used for any purpose other than wastewater evacuation. Each hose assembly has a universal quick disconnect at each end. Do not use black hose to replace or repair any potable water (sand color) hose. Hoses in the set are:

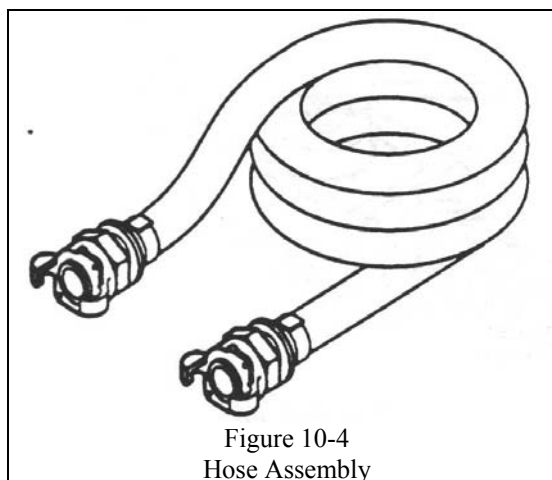


Figure 10-4
Hose Assembly

Hose Assembly, Rubber
NSN: 4730-01-434-9638
PN: 13230E5746-4
(1½ inch x 50 feet)

Hose Assembly, Rubber
NSN: 4730-01-434-9594
PN: 13229E7223-2
(1 inch x 10 feet)

Hose Assembly, Rubber
NSN: 4730-01-434-9605
PN: 13229E7223-3
(1 inch x 20 feet)

Hose Assembly, Rubber
NSN: 6545-01-434-9646
PN: 13229E7223-1
(1 inch x 5 feet)

Hose Assembly, Rubber
NSN: 6545-01-434-9649
PN: 13229E7223-4
(1 inch x 50 feet)

d. *Adapter, Sink.* (NSN: 6545-01-434-9630, PN: 13229E7224) The sink adapter consists of a pipe to hose adapter, a reducing pipe coupling, and a universal quick disconnect coupling half.

Water Distribution and Wastewater Management System (WDWMS)

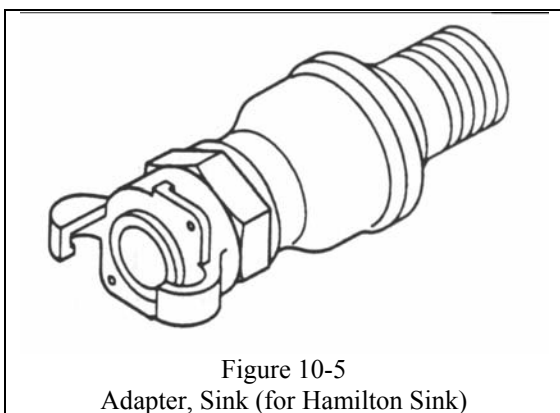


Figure 10-5
Adapter, Sink (for Hamilton Sink)

e. *Hose Assembly, Rubber (Field Sink Drain Hose Assembly).* (NSN: 6545-01-434-9627, PN: 13229E7226) This assembly consists of a section of black hose with a hose coupling assembly on one end and a universal quick disconnect coupling half on the other end. This assembly replaces the existing drain hose on field sinks. The hose assembly is also used to drain the ultrasonic cleaner.

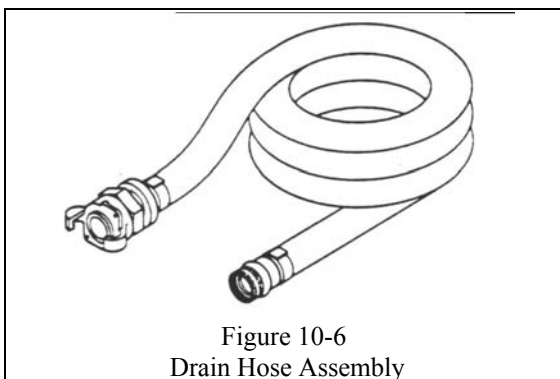


Figure 10-6
Drain Hose Assembly

f. *Stand Assembly, Distribution Nozzle.* (NSN: 4930-01-120-7426, PN: 13225E9140) The Stand Assembly is a collapsible steel tripod. It has chains attached to the legs to prevent them from opening too far. Each leg has a hook at the top to hang the Funnel Assembly.

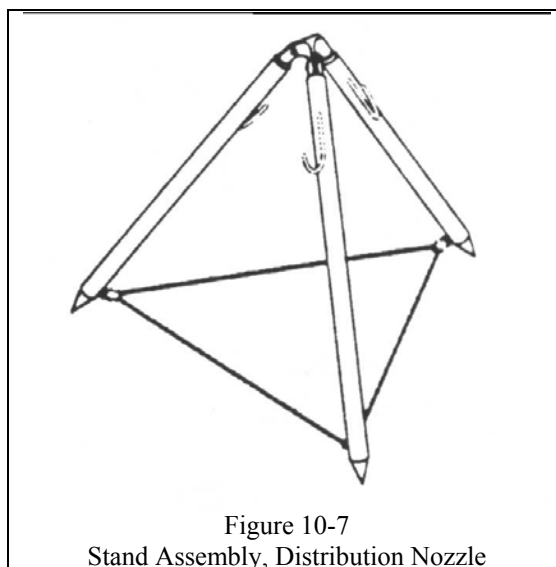


Figure 10-7
Stand Assembly, Distribution Nozzle

g. *Funnel Assembly.* (NSN: 6545-01-434-9587, PN: 13229E7229) The Funnel Assembly consists of a large black funnel with a screen fitted inside, a universal quick disconnect coupling half secured to a discharge tube, and three hooks for hanging the funnel from the Stand Assembly, Distribution Nozzle.

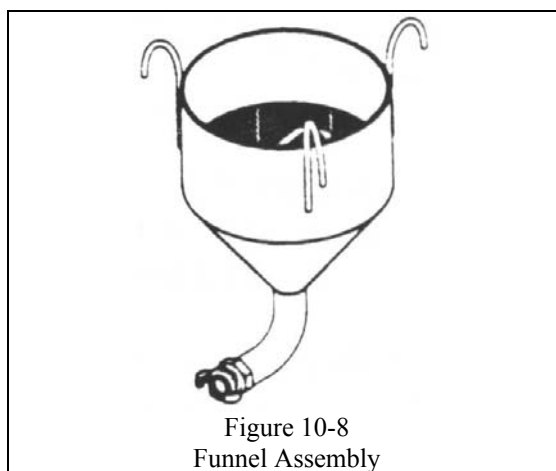
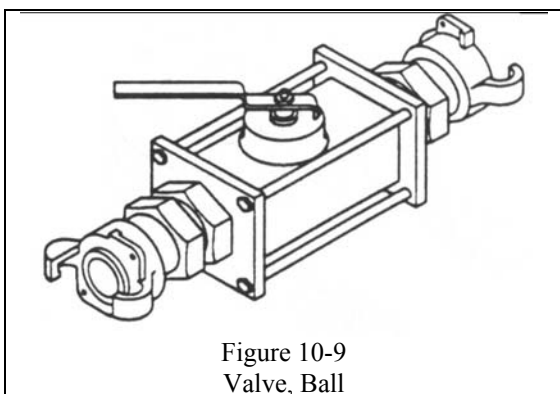


Figure 10-8
Funnel Assembly

WARNING

The Water Distribution Nozzle and the Waste Funnel Assembly should not be suspended from the same Stand Assembly. This could result in contamination of the water system. Use one Stand Assembly for the nozzle and one Stand Assembly for the Funnel Assembly.

h. *Valve, Ball.* (NSN: 4820-01-440-5916, PN: 13225E7225) The ball valve provides a means to close off the WWMS. It is used near the funnel and stand assemblies.



i. *Cage, Wire, Folding.* The Cage is designed to allow the hoses and components to be stored inside the assembly.



Figure 10-10
Cage, Wire,, Folding

j. *Wye, Quick Disconnect* (NSN: 4730-00-496-5952, PN: WW-C-633-M). This fitting is used as a junction connection when fitting three hoses together, or when fitting the Funnel Assembly (NSN: 6545-01-434-9587, PN: 13229E7229) to the wastewater evacuation line.

10-3. Principles of Installation.

The information in this chapter provides guidance to help plan the physical layout for the hospital. Obtain a scale drawing or diagram of the deployed hospital and sketch the layout of the WDS MRI 164 and the WWMS MRI 164 on this diagram. Depending on the size and configuration of the hospital, plan on at least one primary loop, and if weather conditions warrant, the use of one or more secondary loops.

a. *Location of Wastewater Collection Site.* The collection site is the most important factors in setting up the WWMS MRI 164. The terrain as well as the plans of the Unit Commander will dictate placement and the type of collection site(s).

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- The collection site must be at least 300 feet (100 yards) from the hospital boundary.

- It should must not be located on higher terrain that the freshwater tank(s). Position the collection site in an area lower than the rest of the hospital and away from the fresh water tank(s). This will aid the pump in drawing the wastewater and, if a leak occurs, prevent the wastewater from contaminating the other areas of the hospital complex.

- Sufficient space needs to be allocated to ensure waste water does not overflow into areas where its presence would be undesirable.

- Allow space for wastewater evacuation vehicles access to the waste water tank(s).

WARNING

The Wastewater Collection Site MUST be at least 300 feet (100 yards) from the hospital boundary, and should never be on a higher terrain level than the freshwater tank(s).

b. *Location of Pumps.* Locate pumps on each loop, close to the collection site. Note that the power cable on the pump is 40 feet long. **DO NOT USE AN EXTENSION CORD.** Elevate electrical connections (plugs, etc.) on wooden blocks above areas where puddles may form. The pump provided [Pump Assembly, Diaphragm, NSN: 4320-01-440-7388, PN: 13229E7222] is driven by a single-phase 115 volt, 60 Hertz electric motor. The motor should be supplied by a dedicated branch circuit

protected by a fuse or circuit breaker rated at no more than 15 amps.

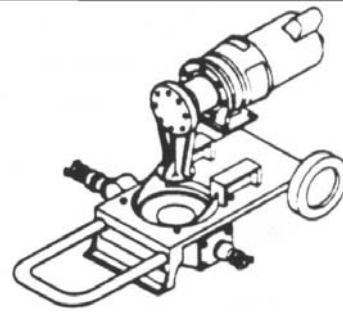


Figure 10-11
Pump

c. *Location of Sinks and Water Distribution Connections.* The WWMS MRI 164 collects wastewater from sinks and drain funnels. The location of WDS MRI 164 components will determine the layout of the WWMS MRI 164 hoses and receptacles. They should be located to preclude cross-contamination of the potable water.

d. *Location of Hose Protection Channels.* Hoses should not cross vehicle routes. Hoses crossing pedestrian paths should be kept to a minimum. If a hose must cross a TEMPER, do so at a passageway, and use a hose protection channel. Where possible, allow waste and fresh water hoses to share a hose protection channel.

10-4. Assembly.

a. This paragraph provides some general guidelines and some rules on how to assemble the WWMS MRI 164. Be prepared to alter the initial plan of the WWMS MRI 164 to be compatible with the WDS MRI 164 and to accommodate movement or addition of sinks, funnels, or collection sites, and to reduce excessively long hose runs.

Water Distribution and Wastewater Management System (WDWMS)

b. Use the sketch of the WWMS MRI 164 layout and position the funnel assemblies. Make all sink and funnel assembly connections. Place the ball valve assembly on the funnel assembly directly or immediately after a 5 foot section of hose. Ensure that all sink drains are plugged and all ball valve assemblies are closed. Add hose assembly sections as necessary to exit structures.

c. The Adapter, Sink (NSN: 6545-01-434-9630, PN: 13229E7224) is forced into the flexible pipe extension of a Hamilton Sink. The universal quick disconnect coupling half is connected to the WWMS MRI 164.

WARNING
To avoid possible contamination, wastewater hose assemblies should never be stored with fresh water hose assemblies. Waste hoses should not be allowed to drip or discharge wastewater onto components of the Water Distribution system.

d. Remove the existing field sink drain hose by unscrewing the $\frac{3}{4}$ inch hose coupling assembly under the sink. Replace it with the Hose Assembly, Rubber (NSN: 6545-01-434-9627, PN: 13229E7226). Following connection the universal quick disconnect coupling half is connected to the WWMS MRI 164.

e. Starting at the sink drain and funnel hose assemblies, lay out the hose sections to connect to the trunk lines. Lay out the trunk lines and determine where the Wye, Quick Disconnect (NSN: 4730-00-496-5952, PN: WW-C-633-M) will be required. Connect all

hose assemblies, using the Wye fittings, where necessary, to complete the system.

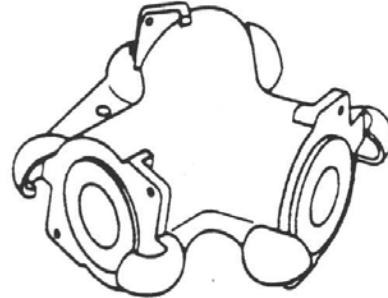


Figure 10-12
Wye, Quick Disconnect

CAUTION
Be sure to check the condition of the gaskets on the hose fittings as you assemble the hoses. Do not drag the hose, you will damage the hose and the fittings.

CAUTION
To ensure proper seating of the fittings, remove all burrs from the fittings using a file (located in the WDWMS MRI 164 Maintenance Set).

WARNING
To avoid injury, limit the amount of hose carried by one person.

f. Connect a 5 foot piece of hose to the funnel and connect the Valve, Ball (NSN: 4820-01-440-5916, PN: 13225E7225) to the 5 foot hose.

g. Position the Pump Assembly, Diaphragm (NSN: 4320-01-440-7388, PN: 13229E7222) as close to the collection site as possible. Long hose runs on the discharge side reduce the pump's capacity.

NOTE: Prior to EVERY setup and use, the operator/maintainer is required to install a reducing coupling and a universal quick disconnect coupling half to the intake side of the pump (it has male threads). The discharge side of the pump has female threads and requires the installation of a 4-inch pipe nipple, a reducing coupling and a universal quick disconnect coupling half.

CAUTION

During installation of the pipe adapters, do not screw the pipe nipple more than 5/8 inch into the discharge port of the Pump Assembly, Diaphragm.

CAUTION

On the Pump Assembly, Diaphragm, be sure to remove the breather filler plug seal before operation. Using pliers to remove, pull the 1-inch long "spaghetti" shaped plastic from the hole drilled horizontally through the breather plug.

CAUTION

The Pump Assembly, Diaphragm should be located at the lowest practical elevation and as close to the evacuation site as possible.

CAUTION

If possible, avoid allowing debris to enter the system. The Pump and Hose Assemblies are capable of passing some solids, however, inducing solids into the system should be avoided.

h. Connect the Pump Assembly, Diaphragm to an approved power source. While the WDS MRI 164 is being flushed, turn on the pump. Observe the system to ensure that there are no leaks and that the pump is working on both intake (suction) and discharge sides. Check tightness of each connection by pouring about one gallon of water into the drain of each sink and funnel to ensure that there are no leaks and that the pump is working properly.

10-5. Operation

a. Monitor the hose assemblies for leaks in the fittings and in the hose.

b. Monitor the evacuation site for leaks and spills. This system is designed to provide collection of the wastewater for evacuation from the site. Coordinate with Preventive Medicine personnel within the Theater to periodically neutralize the collected waste water and evacuate the material from the hospital site for further treatment or disposal.

c. Inspection of the pump.

On a daily basis.

(1) Check the valves. If the discharge valve does not seat properly, vacuum lift is lost. If the intake valve

Water Distribution and Wastewater Management System (WDWWMS)

does not seal, pump efficiency will be lost.

(2) Check the diaphragm for leaks and wear.

(3) Grease the eccentric drive daily with 4 to 6 strokes of a grease gun.

CAUTION

Always keep the sink drains plugged when not actually draining water. Leaving them open will degrade the system and may burn out the Pump Assembly.

10-6. Disassembly

a. The procedures discussed enable you to disassemble the system in a manner that is both safe and efficient. The procedure is intended to be independent of any actions associated with the disassembly of the hospital. However, hose lines located inside a TEMPER must be removed before the tent can be disassembled.

WARNING

Use of non-sterile disposable rubber gloves is recommended when handling wet components of the WWMS. Contact Preventive Medicine personnel for further guidance on this subject.

b. Prior to disassembly of the WWMS MRI 164, prepare at least 5 gallons of disinfectant solutions. The solution is made by mixing 16 ounces (approximately 2 cups) of household

bleach (Sodium Hypochlorite, 0.525%) into 5 gallons of potable water. Use a 5-gallon "Jerry Can" for holding the disinfectant. The working solution is corrosive and will bleach items made of cloth and other liquid absorbing material. Take care not to spill the solution on clothing and boots.

c. Locate the sink or funnel at the most distant location of the medical facility. NOTE: there may be duplicate distant locations, so additional disinfectant should be prepared. With the system in normal operation, pour about one gallon of disinfectant into the plugged sink or funnel (closed ball valve). Allow the solution to sanitize the sink or funnel part for a minute, then remove the sink plug or open the ball valve. Allow the disinfectant solution to be drawn into the WWMS MRI 164 hoses and to the collection tank.

d. Use the disinfectant solution for **ALL sink and funnel locations**. More disinfectant solution may be necessary to properly sanitize those components.

e. Shut down the pump when the sound changes (to appear that it pumping air instead of liquid) to indicate that ALL disinfectant solution has passed through the system and is now in the collection tank.

NOTE

Allow the pump to remove as much of the disinfectant solution as possible before disassembly.

f. Begin disassembly of the WWMS MRI 164 at the point farthest from the collection tank or where TEMPER must be taken down.

NOTE

As wastewater hoses become disconnected, realize that some liquid may be trapped within the hose. Take action to place the lowest point of hoses where they can drain without leakage on TEMPER flooring or on tent material.

g. Disconnect the hoses from the sink or funnel, one at a time. Ensure that recently disconnected hose is raised high enough so that any liquid will drain out.

CAUTION

When removing hoses from a TEMPER, use caution to ensure that the fittings do not damage the tent flooring.

h. Do not replace the field sink drain hose assemblies. The new drain hose assemblies, installed as part of this system will remain with the field sinks. The old, unused drain hose assemblies may be stored with the equipment or handed to medical maintenance personnel.

i. Allow sufficient time for the hose assemblies and other components to dry out or otherwise reduce the liquid trapped in the hoses to manageable levels.

j. Separate the Wye fittings and the Hamilton Sink drain adapters for storage.

k. Collect all hose assemblies at the location of the Cage, Wire, Folding.

l. As much as possible, store similar fittings together.

m. Disconnect the pump from its power source and wind the cord around the handle. This will keep it from dragging when the pump is moved.

n. Remove the adapter fittings installed on the suction and discharge chambers of the pump. Soak these components in the sanitizing solution for at least one minute.

NOTE

On disassembly of the pump, remove the inlet and outlet fittings to prevent breaking the suction or discharge chamber castings.

o. Tilt the pump so that its suction chamber is up and the discharge chamber is aimed towards the ground. Pour one gallon of the sanitizing solution into the suction chamber and allow it to run out the discharge chamber. Do not let the liquid enter the pump motor.

p. Secure or tie the fittings, removed in step *i.* to the pump handle. This will keep them from becoming lost during transport or storage.

q. Physically look over the work area to ensure that no fittings or hose assemblies have been overlooked.

Prior to moving the WWMS MRI 164, ensure that all components of the set are together. Use the inventory list to ensure that nothing is missing.

10-7. Preventive Maintenance. The following preventative checks and

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services should be done daily in addition to the operational checks detailed in paragraph 10-5, above. They should be done before storing or moving the system.

- a. Pump. See Chapter 11.
- b. Hose Assemblies. Check hoses for abrasions, cuts, or gouges. Check for:
 - (1) The presence of bulges in the hose or seepage at the hose fittings during operations.
 - (2) Inspect for rust and deterioration on coupling halves and clamps.
- c. Funnel Assembly. Cleaning the screen requires removing the funnel from the stand assembly prior to removal of the screen. If an attempt is made to remove the screen before removing the funnel from the stand assembly, the screen may tilt. This action may allow large solid material to be introduced into the WWMS MRI 164 and could clog hoses or damage the pump. Clean funnel assembly with sanitizing solution.

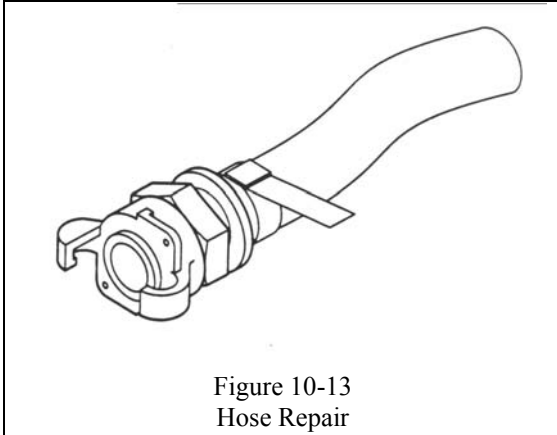
10-8. Repair Procedures. The WDS MRI 164 and the WWMS MRI 164 are supported by the Water Distribution and Wastewater (WDWWMS) MRI 164 Maintenance Set contains an initial stockage of repair parts and tools necessary to maintain the system. Both sets are fielded with the system. As parts are replaced or used in support of the WDS MRI 164 and WWMS MRI 164 the user is responsibility to replenish the components as needed.

- a. Pump. See Chapter 11.
- b. Broken, Torn or Punctured Hoses. The principle behind repairing damaged hose is to make two good hoses from one damaged hose..
 - (1) Use a hacksaw to cut the hose squarely and remove the damaged section. If the short section is 2 feet or less, remove and retain the universal coupling if it is in useable condition. Dispose of hose pieces shorter than 2 feet.

NOTE

Wash hacksaw blade in a dilute bleach solution or hot soapy water after each use to prevent contamination of the hacksaw blade.

- (2) Place a hose clamp (from the maintenance set) over the newly cut end.
- (3) Insert a Universal Quick Disconnect Coupling Half in the cut end as far as it will go.
- (4) Position the hose clamp near the body of the coupling half.
- (5) Tighten the clamp and trim the excess metal strip. Excess metal that is not trimmed must be flattened against the clamp with a hammer. If there are sharp edges, remove them with a small file.



NOTE

The cut ends of banding material are sharp enough to cause deep cuts and tear clothing. Use a file to dull or smooth the sharp edge. Use tape to cover the edge if necessary to prevent cuts during handling.

(6) Repeat steps (2) through (5) for the other piece of hose.

(7) Do not attempt to repair the Hose Assembly, Rubber (NSN: 6545-01-434-9627, PN: 13229E7226) hose if it breaks within 1 foot of the coupling assembly. Replace the entire assembly.

c. Universal Quick Disconnect, Coupling Half, Hose Fittings and Wye fittings. The only repair performed on these parts consists of replacement of the rubber gaskets. Cracked or broken fittings must be replaced.

CHAPTER 11

Operator and Maintenance Manual

PUMP UNIT, RECIPROCATING 13229E7222, ELECTRIC MOTOR DRIVEN (EDSON CORPORATION, MODEL 120EWA)

NSN 4320-01-440-7388

11-1. Introduction

This chapter is for your use in operating and maintaining the Edson Corporation, Model 120EWA, electric motor driven reciprocating pump.

11-2. Maintenance Forms and Records

Maintenance forms and records that you are required to use are explained in TM 38-750.

11-3. Equipment Serviceability Criteria (ESC)

This equipment is not covered by an ESC.

11-4. Description

a. General. The electric motor driven pump (figure 10-1) is a portable, frame mounted, unit designed to evacuate wastewater at the maximum rate of 2,600 gallons per hour at 60 strokes per minute.

b. The pump is equipped with a $\frac{3}{4}$ HP (horsepower), capacitor start, ball bearing motor.

c. If you need a detailed description of any component of the electric motor driven pump, refer to the applicable organizational maintenance information.

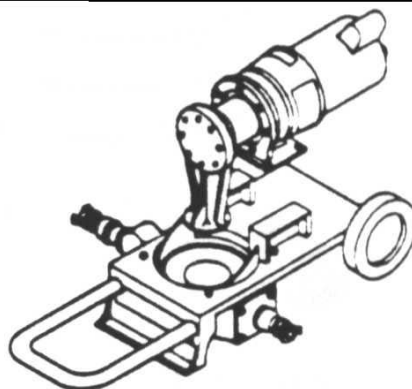


Figure 11-1
Pump Unit, Reciprocating (side view)

11-5. Principles of Installation.

a. The information in this chapter provides guidance to help plan the location of the pumps in the Wastewater Management Sets.

b. *Location of Pumps.* Locate pumps on each loop close to the collection, or discharge, site. Note that the power cable on the pump is 40 feet long. **DO NOT USE AN EXTENSION CORD.** Elevate electrical connections on wooden blocks above areas where puddles may form. The pump should be supplied by a dedicated branch circuit protected by a fuse or circuit breaker rated at no more than 15 amps.

11-6. Preventive Maintenance.

The following preventative checks and services should be done daily. They should also be done prior to storing or moving the pump.

- a. Check the valves. If the discharge valve does not seat properly, vacuum lift is lost. If the intake valve does not seal, pump efficiency will be lost.
- b. Check the diaphragm for leaks and wear.
- c. Grease the eccentric drive daily with 4 to 6 strokes of a grease gun.

11-7. Maintenance and Troubleshooting.

a. Diaphragm and Flapper Valves. These are the primary moving parts of the pump. If the diaphragm leaks, pump efficiency will be lost. If the discharge valve does not seat properly,

vacuum lift will be lost. If the intake valve does not seal, pump efficiency will be lost.

(1) To check, use a vacuum gauge on the intake of the pump/ A reading of 8 to 10 inches Hg indicates all valves and seals are working properly. In lieu of a gauge, place hand over intake and check vacuum. Strong suction indicates good sealing by the valves.

(2) Look for wear and swelling on the valve, rubber (PN: 161-G-107). Swelling can prevent a good seal. Replace valves as required.

NOTE

Over-tightening Valve Rubber Washer and Weights on the inlet and outlet chambers can cause distortion of the valves and poor seal performances.

(3) Check diaphragms for leaks and wear. Replace as required with Diaphragm Valve, Flat (NSN: 4820-01-393-5286, PN: 113-0).

b. Grease eccentric drive every 48 to 72 hours of continuous run operation at full RPM, or as required.

c. Troubleshooting Guide. See Table 11-1 below:

Water Distribution and Wastewater Management System (WDWWMS)

Table 11-1, Troubleshooting

Problem
Cause
Corrective Action

1. PUMP IS PUMPING, NO LIQUID IS BEING PUMPED

Clogged inlet or discharge line, clogged inlet or discharge chamber

Locate and unclog line

No vacuum

Blocked discharge valve (held open)

Clear valve

Hole in inlet hose

Repair or replace hose

Loose fitting on inlet

Make air tight

Worn discharge valve rubber

Replace valve rubber

Worn diaphragm

Replace diaphragm

Inlet vertical head too high or discharge head too high

See set-up instructions above.

Motor not working

Check electrical connections

Pump base chamber has solids trapped and preventing pump from cycling

Clear pump base chamber.

Increase pump speed to prevent solid from dropping out

Use strainer on inlet hose

2. PUMP LEAKS

Loose head ring bolts

Tighten

Loose standard/bolt

Tighten

Diaphragm worn/split

Replace

Problem

Cause

Corrective Action

Discharge vertical head too high

3. PUMP BASE CHAMBER KEEPS FILLING WITH SOLIDS.

CAUTION: THIS PROBLEM CAN LEAD TO COMPLETE STOPPING OF PUMP AND DAMAGE TO DRIVE OR PUMP.

Pump running too slow or with too short a stroke to move solids.

Run pump faster, extend stroke, no faster than 60 cycles per minute.

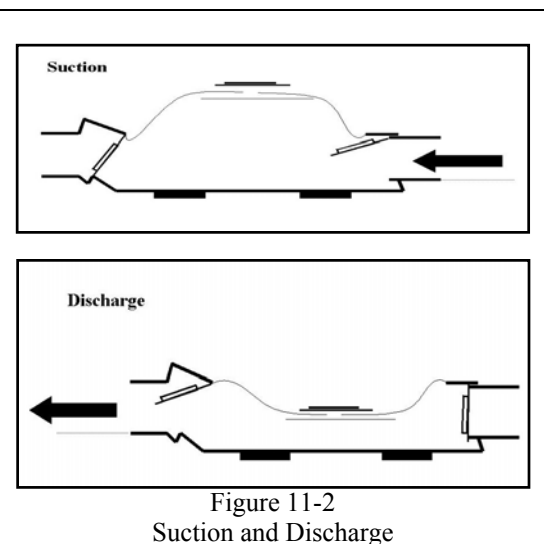
Overall head is too great to move solids through.

Reduce head.

11-8. General Operating Guidelines

a. General Operating Guidelines

(1) Diaphragm pumps are suction pumps. They are designed to create a vacuum on the intake (up) stroke of the pump and positively displace the pump chamber on the down stroke.



(2) Direction of flow and the vacuum lift of the pump are maintained by opposed inlet and outlet flapper valves.

(3) Once the vacuum is filled with liquid, lifting it vertically is easier on the intake stroke.

(4) The force required to displace the pump chamber on the down stroke increases with the height of the discharge above the pump and the volume of liquid in the discharge head.

(5) Any restrictions to flow decreases lift on the intake side and increases force required for discharge.

(6) Increase in viscosity is a resistance to flow and requires more time for liquid to flow. An increase in viscosity decreases lift and discharges heads.

CAUTION

This pump is not designed to be used in cold weather. Using this pump in freezing weather will cause the pump to burn out.

b. Insure Vacuum.

(1) All inlet fittings and hoses should be airtight. Use appropriate tape (Tape, Antisiezing [NSN 8030-00-889-3534, PN: A-A-58092]). On all threaded fittings.

(2) Flapper Valves must be making good seals.

(3) Diaphragm must have good seal and be free of holes.

(4) Pump should be level when in use.

c. Prevent Clogging. Run pump at speed necessary to move solids through the hoses and pump base.

APPENDIX A

INVENTORY LISTS

**WATER DISTRIBUTION SET, HOSPITAL, DEPMEDS
WASTE WATER MANAGEMENT SET, HOSPITAL DEPMEDS
WASTE WATER AUGMENTATION SET, HOSPITAL, DEPMEDS
WATER DISTRIBUTION AND WASTE WATER MANAGEMENT SYSTEM
MAINTENANCE SET, HOSPITAL, DEPMEDS**

Water Distribution and Wastewater Management System (WDWWMS)

Water Distribution Set, Hospital, DEPMEDS

NSN	P/N	Description	QTY	U/M
TBD		Cage, Wire, Folding	19	EA
4320-01-440-4421	13229E7159	Pump Assembly, Centrifugal	2	EA
4520-01-493-7423	111739	Heater, Water, 9,000 Watts	12	EA
4610-01-435-4884	WAL-1031-96	Hypochlorination Unit	1	EA
4610-01-440-4086	13229E7162	Pipe Assembly, Potable	1	AY
4610-01-440-4088	13229E7165	Pipe Assembly, Potable	2	AY
4610-01-440-4090	13229E7163	Indicator, Assembly	2	AY
4610-01-440-6834	13229E7168	Nozzle Assembly, Water	7	AY
4720-01-140-6288	13225E9136-4	Hose Assembly, Nonmetallic	2	EA
4720-01-175-5958	13225E9136-12	Hose Assembly, Nonmetallic	43	EA
4720-01-177-3714	13225E9136-13	Hose Assembly, Nonmetallic	37	EA
4720-01-438-7779	13225E9135-9	Hose Assembly, Nonmetallic	6	EA
4720-01-438-8335	13225E9136-18	Hose Assembly, Nonmetallic	2	EA
4720-01-438-8336	13225E9136-17	Hose Assembly, Nonmetallic	8	EA
4720-01-438-8337	13225E9136-15	Hose Assembly, Nonmetallic	15	EA
4720-01-438-8338	13225E9136-14	Hose Assembly, Nonmetallic	39	EA
4720-01-438-8341	13225E9136-10	Hose Assembly, Nonmetallic	26	EA
4720-01-438-8343	13225E9136-9	Hose Assembly, Nonmetallic	24	EA
4730-01-064-0560	AA59326XI-1-9	Reducer, Quick Disconnect	1	EA
4730-01-186-0821	AA59326XI-1-10	Reducer, Quick Disconnect	1	EA
4730-01-415-6403	13229E7170	Plug, Quick Disconnect	30	EA
4730-01-415-6420	13229E7195	Adapter, Straight, Hose to Boss	30	EA
4730-01-440-4091	13229E0361	Tee Assembly, Quick Disconnect	32	EA
4730-01-440-4609	13229E7172	Tee Assembly, Quick Disconnect	18	AY
4730-01-440-4613	13229E7174	Tee Assembly, Quick Disconnect	18	AY
4730-01-440-4615	13229E7181	Tee Assembly, Quick Disconnect	1	AY
4730-01-440-4633	13229E7182	Tee Assembly, Quick Disconnect	1	AY
4730-01-440-4931	13230E5716	Tee Assembly, Quick Disconnect	1	AY
4730-01-440-4933	13230E5717	Tee Assembly, Quick Disconnect	1	AY
4730-01-440-4938	13230E5715	Tee Assembly, Quick Disconnect	2	AY
4730-01-440-7662	13229E7179	Strainer, Sediment	1	EA
4730-01-440-8569	13229E7173	Coupling Assembly, Quick Disconnect	16	EA
4730-01-445-5188	13229E7190	Adapter Assembly, Quick Disconnect	1	EA
4730-01-487-3575		Tee Assembly, Quick Disconnect	1	AY
4820-01-440-5919	13229E7197	Valve, Check	1	AY
4820-01-440-7798	13229E7167	Valve, Gate	52	EA
4820-01-440-8302	13229E7177	Valve, Gate	5	EA
4820-01-440-8306	13229E7178	Valve, Gate	5	EA
4820-01-440-8765	13229E7169	Valve, Globe	4	EA
4930-01-120-7426	13225E9140	Stand Assembly, Distribution Nozzle	7	EA
6625-01-449-2857	13229E7189	Case, Electrical-Electronic Test	1	EA
6630-01-044-0334	U25377	Comparator, Color	1	EA
7240-00-089-3827	MIL-C-43613	Can, Water, Military	1	EA
4730-01-499-8687	3629	Reducer, Quick Disconnect	6	EA
4730-01-499-8752	3630	Reducer, Quick Disconnect	6	EA

Water Distribution and Wastewater Management System (WDWWMS)

Water Distribution Set, Hospital, DEPMEDS Associated Support Items of Equipment (ASIOE)

NSN	P/N	Description	QTY	U/M
5430-01-406-0507	T12938	Tank Assembly, Fabric Collapsible	1	EA
8115-01-241-7524	C13825	Container, Cargo	1	EA

Water Distribution and Wastewater Management System (WDWWMS)

Wastewater Management Set, Hospital, DEPMEDS

NSN	P/N	Description	QTY	U/M
TBD		Cage, Wire, Folding	16	EA
4320-01-440-7388	13229E7222	Pump Assembly, Diaphragm	3	EA
4720-01-434-9594	13229E7223-2	Hose Assembly, Rubber	48	EA
4720-01-434-9605	13229E7223-3	Hose Assembly, Rubber	72	EA
4720-01-434-9627	13229E7226	Hose Assembly, Rubber	34	EA
4720-01-434-9638	13230E5746-4	Hose Assembly, Rubber	6	EA
4720-01-434-9646	13229E7223-1	Hose Assembly, Rubber	22	EA
4720-01-434-9649	13229E7223-4	Hose Assembly, Rubber	17	EA
4730-00-496-5952	WW-C-633-M	Wye, Quick Disconnect	48	EA
4730-01-064-0560	AA59326XI-1-9	Reducer, Quick Disconnect	1	EA
4730-01-186-0821	AA59326XI-1-10	Reducer, Quick Disconnect	1	EA
4820-01-440-5916	13225E7225	Valve, Ball	2	EA
4930-01-120-7426	13225E9140	Stand Assembly, Distribution Nozzle	2	EA
6545-01-434-9587	13229E7229	Funnel Assembly	2	EA
6545-01-434-9630	13229E7224	Adapter, Sink	16	EA

Wastewater Management Set, Hospital, DEPMEDS Associated Support Items of Equipment (ASIOE)

NSN	LIN	Description	QTY	U/M
5430-01-406-0507	T12938	Tank Assembly, Fabric Collapsible	1	EA
8115-01-241-7524	C13825	Container, Cargo	1	EA

Water Distribution and Wastewater Management System (WDWWMS)

Wastewater Augmentation Set, Hospital, DEPMEDS

NSN	P/N	Description	QTY	U/M
TBD		Cage, Wire, Folding	5	EA
4320-01-440-4421	13229E7159	Pump Assembly, Centrifugal	1	EA
4610-01-435-4884	WAL-1031-96	Hypochlorination Unit	1	EA
4610-01-440-4086	13229E7162	Pipe Assembly, Potable	1	AY
4610-01-440-4088	13229E7165	Pipe Assembly, Potable	1	AY
4610-01-440-4090	13229E7163	Indicator, Assembly	1	AY
4610-01-440-6834	13229E7168	Nozzle Assembly, Water	1	AY
4710-00-057-7252	MIL-P-236	Pipe , Culvert, Metallic	8	EA
4720-01-140-6288	13225E9136-4	Hose Assembly, Nonmetallic	1	EA
4720-01-175-5958	13225E9136-12	Hose Assembly, Nonmetallic	5	EA
4720-01-177-3714	13225E9136-13	Hose Assembly, Nonmetallic	10	EA
4720-01-434-9594	13229E7223-2	Hose Assembly, Rubber	4	EA
4720-01-434-9605	13229E7223-3	Hose Assembly, Rubber	10	EA
4720-01-434-9627	13229E7226	Hose Assembly, Rubber	5	EA
4720-01-434-9638	13230E5746-4	Hose Assembly, Rubber	1	EA
4720-01-434-9646	13229E7223-1	Hose Assembly, Rubber	8	EA
4720-01-434-9649	13229E7223-4	Hose Assembly, Rubber	2	EA
4720-01-438-7779	13225E9135-9	Hose Assembly, Nonmetallic	1	EA
4720-01-438-8336	13225E9136-17	Hose Assembly, Nonmetallic	1	EA
4720-01-438-8337	13225E9136-15	Hose Assembly, Nonmetallic	2	EA
4720-01-438-8338	13225E9136-14	Hose Assembly, Nonmetallic	5	EA
4720-01-438-8341	13225E9136-10	Hose Assembly, Nonmetallic	2	EA
4720-01-438-8343	13225E9136-9	Hose Assembly, Nonmetallic	3	EA
4720-01-440-4925	13229E7176	Channel, Hose Protector	10	AY
4720-01-440-4928	13229E7175	Channel, Hose Protector	5	EA
4730-00-496-5952	WW-C-633-M	Wye, Quick Disconnect	10	EA
4730-01-064-0560	AA59326XI-1-9	Reducer, Quick Disconnect	1	EA
4730-01-186-0821	AA59326XI-1-10	Reducer, Quick Disconnect	1	EA
4730-01-415-6403	13229E7170	Plug, Quick Disconnect	4	EA
4730-01-415-6420	13229E7195	Adapter, Straight, Hose to Boss	4	EA
4730-01-440-4609	13229E7172	Tee Assembly, Quick Disconnect	2	EA
4730-01-440-4614	354 0910	Nipple, Pipe	4	EA
4730-01-440-4615	13229E7181	Tee Assembly, Quick Disconnect	1	AY
4730-01-440-4633	13229E7182	Tee Assembly, Quick Disconnect	1	AY
4730-01-440-7662	13229E7179	Strainer, Sediment	1	EA
4730-01-440-8569	13229E7173	Coupling Assembly, Quick Disconnect	3	EA
4730-01-487-3575	13229E7174	Tee Assembly, Quick Disconnect	1	EA
4820-01-440-5916	13225E7225	Valve, Ball	1	EA
4820-01-440-5919	13229E7197	Valve, Check	1	AY
4820-01-440-7798	13229E7167	Valve, Gate	4	EA
4820-01-440-8302	13229E7177	Valve, Gate	1	EA
4820-01-440-8306	13229E7178	Valve, Gate	1	EA
4820-01-440-8309	13229E7196	Valve, Gate	1	EA
4820-01-440-8765	13229E7169	Valve, Globe	1	EA

Water Distribution and Wastewater Management System (WDWWMS)

NSN	P/N	Description	QTY	U/M
5985-01-392-9111	AL2423-09-4	Case, Meter and Gauge	1	EA
6545-01-434-9630	13229E7224	Adapter, Sink	4	EA
6545-01-440-7388	13229E7222	Pump Assembly, Reciprocating	1	EA
6630-01-044-0334	U25377	Comparator, Color	1	EA
7240-00-089-3827	MIL-C-43613	Can, Water, Military	1	EA

Wastewater Augmentation Set, Hospital, DEPMEDS Associated Support Items of Equipment (ASIOE)

NSN	LIN	Description	QTY	U/M
5430-01-170-6984	T19033	Tank Assembly, Fabric Collapsible	2	EA
8115-01-241-7524	C13825	Container, Cargo	1	EA

Water Distribution and Wastewater Management System (WDWWMS)

Water Distribution and Wastewater Maintenance Set, MF2K

NSN	P/N	Description	QTY	U/M
4930-00-253-2478	MIL-G-3859	Lubricating Gun, Hand	1	EA
5110-00-234-6534	A-A-2311	File, Hand	1	EA
5110-00-241-9151	A-A-2312	File, Hand	1	EA
5110-00-263-0349	NN-H-00106	Handle, File	2	EA
5110-00-277-4590	GGG-B-451	Blade, Hand Hacksaw	1	BD
5110-00-289-9657	A-A-453	Frame, Hand Hacksaw	1	EA
5120-00-061-8545	A-A-1305	Hammer, Hand	1	EA
5120-00-223-7397	B107.23M	Pliers, Slip Joint	1	EA
5120-00-277-1479	GGG-W-651	Wrench, Pipe	2	EA
5120-00-010-7916	B107.15	Screwdriver, Flat Tip	1	EA
5140-00-498-8772	CH77	Tool Box, Portable	3	EA
5330-00-360-0595	H064330M	Gasket	20	EA
5330-00-741-7728	MIL-P-11719	Packing, Preformed	20	EA
9150-01-226-4315	Pacesetter EP-65	Grease, General Purpose	3	TU
4010-00-228-9948	RR-C-271	Chain, Weldless	1	BX
4030-00-780-9350	MS87006-13	Hook, Chain	1	HD
4720-00-200-0361	ZZ-H-601	Hose Nonmetallic	100	FT
4720-00-876-8903	J-409	Clamp, Hose	2	EA
4720-01-392-2299	ZZ-H-601	Hose Nonmetallic	50	FT
4730-00-088-4298	AWR14	Seal	5	EA
4730-00-360-0592	MS27021-9	Coupling, Half, Quick Disconnect	4	EA
4730-00-360-0715	A-A-59326/11	Plug, Quick Disconnect	5	EA
4730-00-496-5953	AM-11	Coupling, Half, Quick Disconnect	4	EA
4730-00-823-5316	A-A-59326-11	Plug, Quick Disconnect	4	EA
4730-00-869-5246	MS27028-9	Cap, Quick Disconnect	4	EA
4730-00-909-8627	A-A-52506	Clamp, Hose	100	EA
4730-00-929-0791	MS27028-5	Cap, Quick Disconnect	5	EA
4730-00-948-1722	A-A-59326-6	Coupling, Half, Quick Disconnect	4	EA
4730-01-007-9254	J 405	Clamp, Hose	20	EA
4730-01-164-9254	MS27021-5	Coupling, Half, Quick Disconnect	5	EA
4730-01-222-0943	WW-C-633	Coupling, Half, Quick Disconnect	2	EA
4730-01-223-4931	MS27025-5	Coupling, Half, Quick Disconnect	5	EA
5325-00-926-5411	H01434M	Ring, Retaining	30	EA
5330-00-088-9167	MS27030-3	Gasket	25	EA
5330-00-612-2414	H7388M	Gasket	4	EA
5330-00-899-4509	H6476M	Gasket	10	EA
5330-01-141-1864	13220E1069-1	Gasket	10	EA
7510-00-074-5124	A-A-1586	Tape, Pressure Sensitive, Adh	2	RO
8030-00-889-3534	A-A-58092	Tape, Antisiezing	25	EA
6810-01-358-4336	13229E0923	Sodium, Hypochlorite Technical	6	BG

APPENDIX B

INVENTORY LISTS

**WATER DISTRIBUTION SET, HOSPITAL, MRI 84 BED
WASTE WATER MANAGEMENT SET, HOSPITAL MRI 84 BED
WATER DISTRIBUTION AND WASTEWATER MANAGEMENT SYSTEM
MAINTENANCE SET, HOSPITAL, MRI 84 BED**

Water Distribution and Wastewater Management System (WDWWMS)

Water Distribution Set, Hospital, MRI 84 BED

NSN	P/N	Description	QTY	U/M
TBD		Cage, Wire, Folding	7	EA
4320-01-440-4421	13229E7159	Pump Assembly, Centrifugal	2	EA
4520-01-492-7423	111739	Heater, Water, 9,000 Watts	8	EA
4610-01-435-4884	WAL-1031-96	Hypochlorination Unit	1	EA
4610-01-440-4086	13229E7162	Pipe Assembly, Potable	1	AY
4610-01-440-4088	13229E7165	Pipe Assembly, Potable	1	AY
4610-01-440-4090	13229E7163	Indicator, Assembly	1	AY
4610-01-440-6834	13229E7168	Nozzle Assembly, Water	2	AY
4720-01-175-5958	13225E9136-12	Hose Assembly, Nonmetallic	11	EA
4720-01-177-3714	13225E9136-13	Hose Assembly, Nonmetallic	14	EA
4720-01-438-7779	13225E9135-9	Hose Assembly, Nonmetallic	1	EA
4720-01-438-8335	13225E9136-18	Hose Assembly, Nonmetallic	2	EA
4720-01-438-8337	13225E9136-15	Hose Assembly, Nonmetallic	8	EA
4720-01-438-8338	13225E9136-14	Hose Assembly, Nonmetallic	10	EA
4720-01-438-8341	13225E9136-10	Hose Assembly, Nonmetallic	20	EA
4720-01-438-8343	13225E9136-9	Hose Assembly, Nonmetallic	6	EA
4720-01-440-4925	13229E7176	Channel, Hose Protector	7	AY
4730-01-415-6403	13229E7170	Plug, Quick Disconnect	16	EA
4730-01-415-6420	13229E7195	Adapter, Straight, Hose to Boss	16	EA
4730-01-440-4091	13229E0361	Tee Assembly, Quick Disconnect	20	EA
4730-01-440-4609	13229E7172	Tee Assembly, Quick Disconnect	10	EA
4730-01-440-4615	13229E7181	Tee Assembly, Quick Disconnect	4	AY
4730-01-440-7662	13229E7179	Strainer, Sediment	1	EA
4730-01-440-8569	13229E7173	Coupling Assembly, Quick Disconnect	13	EA
4730-01-487-3575	13229E7174	Tee Assembly, Quick Disconnect	1	EA
4820-00-089-3827	13229E7197	Valve, Check	1	AY
4820-01-440-7798	13229E7167	Valve, Gate	20	EA
4820-01-440-8302	13229E7177	Valve, Gate	3	EA
4820-01-440-8306	13229E7178	Valve, Gate	3	EA
4820-01-440-8765	13229E7169	Valve, Globe	1	EA
4930-01-120-7426	13225E9140	Stand Assembly, Distribution Nozzle	2	EA
6625-01-449-2857	13229E7189	Case, Electrical-Electronic Test	1	EA
6630-01-044-0334	U25377	Comparator, Color	1	EA
7240-00-089-3827	MIL-C-43613	Can, Water, Military	1	EA
4730-01-499-8687	3629	Reducer, Quick Disconnect	4	EA
4730-01-499-8752	3630	Reducer, Quick Disconnect	4	EA
4720-01-440-4925	13229E7176	Channel, Hose Protector	4	AY
4720-01-440-4928	13229E7175	Channel, Hose Protector	2	EA

Water Distribution and Wastewater Management System (WDWWMS)

Water Distribution Set, Hospital, MRI 84 BED Associated Support Items of Equipment (ASIOE)

NSN	LIN	Description	QTY	U/M
		Tank Assembly, Fabric Collapsible	1	EA
8115-01-241-7524	C13825	Container, Cargo	1	EA

Wastewater Management Set, Hospital, MRI 84 BED

NSN	P/N	Description	QTY	U/M
TBD		Cage, Wire, Folding	8	EA
4320-01-440-7388	13229E7222	Pump Assembly, Diaphragm	2	EA
4720-01-434-9594	13229E7223-2	Hose Assembly, Rubber	6	EA
4720-01-434-9605	13229E7223-3	Hose Assembly, Rubber	17	EA
4720-01-434-9627	13229E7226	Hose Assembly, Rubber	16	EA
4720-01-434-9646	13229E7223-1	Hose Assembly, Rubber	10	EA
4720-01-434-9649	13229E7223-4	Hose Assembly, Rubber	1	EA
4720-01-440-4925	13229E7176	Channel, Hose Protector	2	AY
4730-00-496-5952	WW-C-633-M	Wye, Quick Disconnect	10	EA
4820-01-440-5916	13225E7225	Valve, Ball	2	EA
4930-01-120-7426	13225E9140	Stand Assembly, Distribution Nozzle	2	EA
6545-01-434-9587	13229E7229	Funnel Assembly	2	EA
6545-01-434-9630	13229E7224	Adapter, Sink	11	EA

Wastewater Management Set, Hospital, MRI 84 BED Associated Support Items of Equipment (ASIOE)

NSN	LIN	Description	QTY	U/M
		Tank Assembly, Fabric Collapsible	1	EA
8115-01-241-7524	C13825	Container, Cargo	1	EA

Water Distribution and Wastewater Management System (WDWWMS)

Water Distribution and Waste Water Maintenance Set, MRI 84

NSN	P/N	Description	QTY	U/M
4010-00-228-9948	RR-C-271	Chain, Weldless	1	BX
4030-00-780-9350	MS87006-13	Hook, Chain	1	HD
4720-00-200-0361	ZZ-H-601	Hose Nonmetallic	50	FT
4720-00-876-8903	J-409	Clamp, Hose	2	EA
4720-01-392-2299	ZZ-H-601	Hose Nonmetallic	20	FT
4730-00-909-8627	A-A-52506	Clamp, Hose	50	EA
4730-01-007-9254	J 405	Clamp, Hose	20	EA
4930-00-253-2478	MIL-G-3859	Lubricating Gun, Hand	1	EA
5110-00-234-6534	A-A-2311	File, Hand	1	EA
5110-00-241-9151	A-A-2312	File, Hand	1	EA
5110-00-263-0349	NN-H-00106	Handle, File	2	EA
5110-00-277-4590	GGG-B-451	Blade, Hand Hacksaw	1	BD
5110-00-289-9657	A-A-453	Frame, Hand Hacksaw	1	EA
5120-00-061-8545	A-A-1305	Hammer, Hand	1	EA
5120-00-223-7397	B107.23M	Pliers, Slip Joint	1	EA
5120-00-277-1479	GGG-W-651	Wrench, Pipe	2	EA
5120-01-045-8638	B107.15	Screwdriver, Flat Tip	1	EA
5140-00-498-8772	CH77	Tool Box, Portable	3	EA
5325-00-926-5411	H01434M	Ring, Retaining	30	EA
5330-00-088-9167	MS27030-3	Gasket	25	EA
5330-00-360-0595	H064330M	Gasket	20	EA
5330-00-612-2414	H7388M	Gasket	2	EA
5330-00-741-7728	MIL-P-11719	Packing, Preformed	10	EA
5340-01-449-2815	13229E7184	Strap, Webbing	8	EA
6810-01-358-4336	13229E0923	Sodium, Hypochlorite Technical	6	BG
7240-01-449-1650	13229E7171	Funnel Screen, Black	2	EA
7510-00-074-5124	A-A-1586	Tape, Pressure Sensitive, Adh	2	RO
8030-00-889-3534	A-A-58092	Tape, Antisiezing	25	EA
9150-01-226-4315	Pacesetter EP-65	Grease, General Purpose	3	TU

APPENDIX C

INVENTORY LISTS

**WATER DISTRIBUTION SET, HOSPITAL, MRI 164 BED
WASTE WATER MANAGEMENT SET, HOSPITAL MRI 164 BED
WATER DISTRIBUTION AND WASTEWATER MANAGEMENT SYSTEM
MAINTENANCE SET, HOSPITAL, MRI 164 BED**

**The following represents an initial design for this configuration
It has not been finalized or tested**

Water Distribution and Wastewater Management System (WDWWMS)

Water Distribution Set, Hospital, MRI 164 Bed (preliminary design)

NSN	P/N	Description	QTY	U/M
TBD		Cage, Wire, Folding	13	EA
4320-01-440-4421	13229E7159	Pump Assembly, Centrifugal	3	EA
4520-01-493-7423	111739	Heater, Water, 9,000 Watts	8	EA
4610-01-435-4884	WAL-1031-96	Hypochlorination Unit	1	EA
4610-01-440-4086	13229E7162	Pipe Assembly, Potable	1	AY
4610-01-440-4088	13229E7165	Pipe Assembly, Potable	1	AY
4610-01-440-4090	13229E7163	Indicator, Assembly	1	AY
4610-01-440-6834	13229E7168	Nozzle Assembly, Water	1	AY
4720-01-140-6288	13225E9136-4	Hose Assembly, Nonmetallic	2	EA
4720-01-175-5958	13225E9136-12	Hose Assembly, Nonmetallic	12	EA
4720-01-177-3714	13225E9136-13	Hose Assembly, Nonmetallic	7	EA
4720-01-438-7779	13225E9135-9	Hose Assembly, Nonmetallic	11	EA
4720-01-438-8335	13225E9136-18	Hose Assembly, Nonmetallic	7	EA
4720-01-438-8336	13225E9136-17	Hose Assembly, Nonmetallic	6	EA
4720-01-438-8337	13225E9136-15	Hose Assembly, Nonmetallic	1	EA
4720-01-438-8338	13225E9136-14	Hose Assembly, Nonmetallic	19	EA
4720-01-438-8341	13225E9136-10	Hose Assembly, Nonmetallic	20	EA
4720-01-438-8343	13225E9136-9	Hose Assembly, Nonmetallic	5	EA
4720-01-440-4925	13229E7176	Channel, Hose Protector	8	AY
4730-01-064-0560	AA59326XI-1-9	Reducer, Quick Disconnect	1	EA
4730-01-186-0821	AA59326XI-1-10	Reducer, Quick Disconnect	1	EA
4730-01-415-6403	13229E7170	Plug, Quick Disconnect	17	EA
4730-01-415-6420	13229E7195	Adapter, Straight, Hose to Boss	17	EA
4730-01-440-4091	13229E0361	Tee Assembly, Quick Disconnect	9	EA
4730-01-440-4609	13229E7172	Tee Assembly, Quick Disconnect	17	AY
4730-01-440-4613	13229E7174	Tee Assembly, Quick Disconnect	5	AY
4730-01-440-4615	13229E7181	Tee Assembly, Quick Disconnect	1	AY
4730-01-440-4633	13229E7182	Tee Assembly, Quick Disconnect	1	AY
4730-01-440-7662	13229E7179	Strainer, Sediment	1	EA
4730-01-440-8569	13229E7173	Coupling Assembly, Quick Disconnect	11	EA
4730-01-445-5188	13229E7190	Adapter Assembly, Quick Disconnect	1	EA
4730-01-487-3575		Tee Assembly, Quick Disconnect	1	AY
4820-01-440-5919	13229E7197	Valve, Check	1	AY
4820-01-440-7798	13229E7167	Valve, Gate	27	EA
4820-01-440-8306	13229E7178	Valve, Gate	1	EA
4820-01-440-8765	13229E7169	Valve, Globe	1	EA
4930-01-120-7426	13225E9140	Stand Assembly, Distribution Nozzle	1	EA
6625-01-449-2857	13229E7189	Case, Electrical-Electronic Test	1	EA
6630-01-044-0334	U25377	Comparator, Color	1	EA
7240-00-089-3827	MIL-C-43613	Can, Water, Military	1	EA
4730-01-499-8752	3629	Reducer, Quick Disconnect	2	EA
4730-01-499-8687	3630	Reducer, Quick Disconnect	2	EA

Water Distribution and Wastewater Management System (WDWWMS)

Water Distribution Set, Hospital, MRI 164 Bed Associated Support Items of Equipment (ASIOE) (preliminary design)

NSN	LIN	Description	QTY	U/M
5430-01-406-0507	T12938	Tank Assembly, Fabric Collapsible	1	EA
8115-01-241-7524	C13825	Container, Cargo	1	EA

Wastewater Management Set, Hospital, MRI 164 Bed (preliminary design)

NSN	P/N	Description	QTY	U/M
TBD		Cage, Wire, Folding	7	EA
4320-01-440-7388	13229E7222	Pump Assembly, Diaphragm	4	EA
4720-01-140-6288	13225E9136-4	Hose Assembly, Nonmetallic	2	EA
4720-01-434-9594	13229E7223-2	Hose Assembly, Rubber	19	EA
4720-01-434-9605	13229E7223-3	Hose Assembly, Rubber	24	EA
4720-01-434-9627	13229E7226	Hose Assembly, Rubber	17	EA
4720-01-434-9638	13230E5746-4	Hose Assembly, Rubber	4	EA
4720-01-434-9646	13229E7223-1	Hose Assembly, Rubber	21	EA
4720-01-434-9649	13229E7223-4	Hose Assembly, Rubber	15	EA
4730-00-496-5952	WW-C-633-M	Wye, Quick Disconnect	29	EA
4730-01-064-0560	AA59326XI-1-9	Reducer, Quick Disconnect	1	EA
4730-01-186-0821	AA59326XI-1-10	Reducer, Quick Disconnect	1	EA
4820-01-440-5916	13225E7225	Valve, Ball	4	EA
4930-01-120-7426	13225E9140	Stand Assembly, Distribution Nozzle	1	EA
6545-01-434-9587	13229E7229	Funnel Assembly	1	EA
6545-01-434-9630	13229E7224	Adapter, Sink	7	EA
4720-01-440-4925	13229E7176	Channel, Hose Protector	5	AY

Wastewater Management Set, Hospital, MRI 164 Bed Associated Support Items of Equipment (ASIOE) (preliminary design)

NSN	LIN	Description	QTY	U/M
5430-01-406-0507	T12938	Tank Assembly, Fabric Collapsible	1	EA
8115-01-241-7524	C13825	Container, Cargo	1	EA

Water Distribution and Wastewater Management System (WDWWMS)

Water Distribution and Wastewater Management, Maintenance Set, MRI 164 (preliminary design)

NSN	P/N	Description	QTY	U/M
	MIL-G-3859	Lubricating Gun, Hand	1	EA
5110-00-234-6534	A-A-2311	File, Hand	1	EA
5110-00-241-9151	A-A-2312	File, Hand	1	EA
5110-00-263-0349	NN-H-00106	Handle, File	2	EA
5110-00-277-4590	GGG-B-451	Blade, Hand Hacksaw	1	BD
5110-00-289-9657	A-A-453	Frame, Hand Hacksaw	1	EA
5120-00-061-8545	A-A-1305	Hammer, Hand	1	EA
5120-00-223-7397	B107.23M	Pliers, Slip Joint	1	EA
5120-00-277-1479	GGG-W-651	Wrench, Pipe	2	EA
5120-01-045-8638	B107.15	Screwdriver, Flat Tip	1	EA
5140-00-498-8772	CH77	Tool Box, Portable	3	EA
5330-00-360-0595	H064330M	Gasket	20	EA
5330-00-741-7728	MIL-P-11719	Packing, Preformed	20	EA
9150-01-226-4315	Pacesetter EP-65	Grease, General Purpose	3	TU
4010-00-228-9948	RR-C-271	Chain, Weldless	1	BX
4030-00-780-9350	MS87006-13	Hook, Chain	1	HD
4720-00-200-0361	ZZ-H-601	Hose Nonmetallic	200	FT
4720-00-876-8903	J-409	Clamp, Hose	10	EA
4720-01-392-2299	ZZ-H-601	Hose Nonmetallic	200	FT
4730-00-088-4298	AWR14	Seal	1	EA
4730-00-360-0592	MS27021-9	Coupling, Half, Quick Disconnect	5	EA
4730-00-360-0715	A-A-59326/11	Plug, Quick Disconnect	5	EA
4730-00-496-5953	AM-11	Coupling, Half, Quick Disconnect	5	EA
4730-00-823-5316	A-A-59326-11	Plug, Quick Disconnect	5	EA
4730-00-869-5246	MS27028-9	Cap, Quick Disconnect	5	EA
4730-00-909-8627	A-A-52506	Clamp, Hose	10	EA
4730-00-929-0791	MS27028-5	Cap, Quick Disconnect	5	EA
4730-00-948-1722	A-A-59326-6	Coupling, Half, Quick Disconnect	5	EA
4730-01-007-9254	J 405	Clamp, Hose	10	EA
4730-01-164-9254	MS27021-5	Coupling, Half, Quick Disconnect	5	EA
4730-01-222-0943	WW-C-633	Coupling, Half, Quick Disconnect	5	EA
4730-01-223-4931	MS27025-5	Coupling, Half, Quick Disconnect	5	EA
5325-00-926-5411	H01434M	Ring, Retaining	100	EA
5330-00-088-9167	MS27030-3	Gasket	20	EA
5330-00-612-2414	H7388M	Gasket	5	EA
5330-00-899-4509	H6476M	Gasket	2	EA
5330-01-141-1864	13220E1069-1	Gasket	2	EA
7510-00-074-5124	A-A-1586	Tape, Pressure Sensitive, Adh	4	RO
8030-00-889-3534	A-A-58092	Tape, Antisiezing	20	EA
6810-01-358-4336	13229E0923	Sodium, Hypochlorite Technical	12	BG

APPENDIX D
INVENTORY LIST
WATER CONNECTION SET

**The following represents an initial design for this configuration
It has not been finalized or tested**

Water Distribution and Wastewater Management System (WDWWMS)

Water Connection Set (*preliminary design*)

NSN	P/N	Description	QTY	U/M
TBD		Cage, Wire, Folding	3	EA
4720-01-438-8335	13225E9136-18	Hose Assembly, Nonmetallic	10	EA
4820-01-440-8306	13229E7178	Valve, Gate	1	EA
4730-01-064-0560	AA59326XI-1-9	Reducer, Quick Disconnect	1	EA

**APPENDIX E
ORGANIZATIONAL MAINTENANCE
REPAIR PARTS AND COMPONENTS
WATER DISTRIBUTION SET**

SECTION 1. INTRODUCTION

E-1. Scope. This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for the performance of organizational maintenance of the Water Distribution Set, Hospital, DEPMEDS.

E-2. General. In addition to Section 1, Introduction, this Repair Parts and Special Tools List is divided into the following sections:

a. Section 2 – Repair Parts List. A list of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of parts, with the components of each part listed in ascending figure and item number sequence. Bulk materials are listed by item name in FIG BULK at the end of the section.

b. Section 3 – Special Tools List. Not applicable.

c. Section 4 – Cross reference Indexes. Not applicable.

E-3. Explanation of Columns (Section 2).

a. FIG NO. (Column 1). This column lists the number of the figure where the item is identified/located.

b. ITEM NO. (Column 2). Indicates the number used to identify items called out in the illustration.

c. SMR Code. Not applicable.

d. NSN (Column 3). The National Stock Number which is used to identify the item.

e. PART NUMBER (Column 4). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity) which controls the design, specifications, standards, and inspection requirements to identify an item or range of items.

f. DESCRIPTION (Column 5). This column contains the following information:

(1) The Federal Item name and, when required, a minimum description to identify the item.

(2) Spare/repair parts that make up an assembled item are listed immediately following the assembled item line entry.

(3) Part numbers for bulk materials are references in this column in the line item entry for the item to be manufactured/fabricated.

(4) The usable on code. Not applicable.

g. QTY (Column 6). The QTY (quantity per figure column) indicates the quantity of the item used in the illustration figure. A “V” appearing in this column in lieu of a quantity indicates that the quantity is variable and quantity may vary from application to application.

h. UI Column 7). The UI (Unit of Issue) indicates the unit of issue of the item used in the illustrated figure. A “AR” appearing in this column in lieu of a unit of issue indicates that the unit is as required and may vary from application to application.

E-4. Explanation of Columns (Section 4). Not applicable.

E-5. Special Information. Not applicable.

E-6. How to Locate Repair Parts.

a. When NSN or Part Number is Not Known.

(1) First. Using the table of contents, determine the assembly group or subassembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and listings are divided into the same groups.

(2) Second. Find the figure covering the assembly group of subassembly group to which the item belongs.

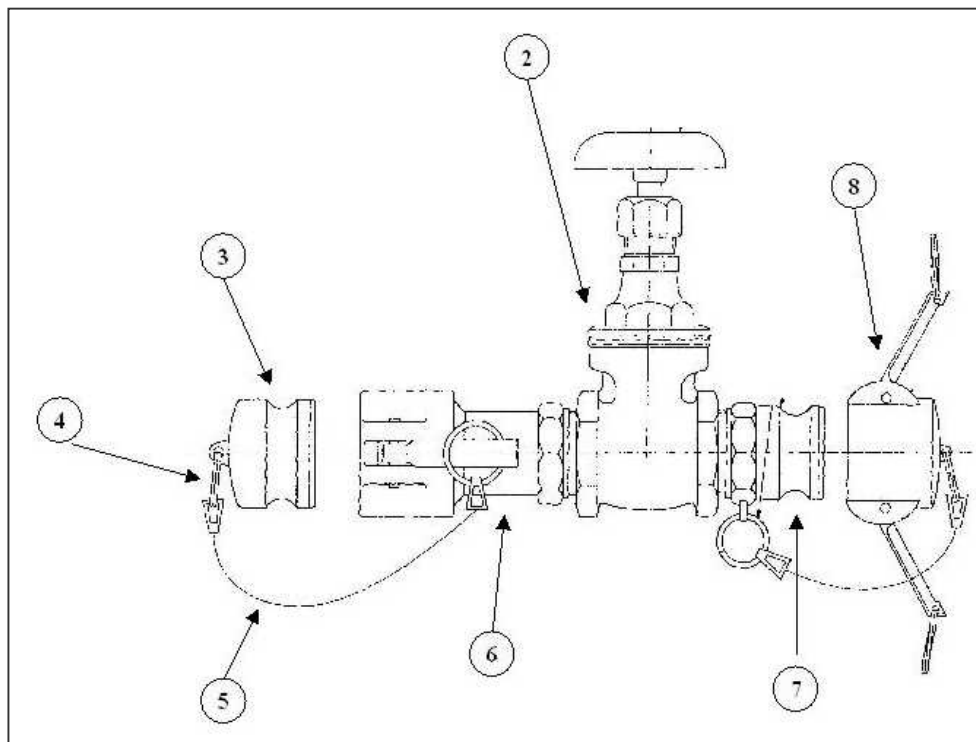
(3) Third. Identify the item on the figure and use the corresponding table to find the NSN or Part Number.

b. When NSN or Part Number is Known. Not applicable.

E-7. Abbreviations. Not applicable.

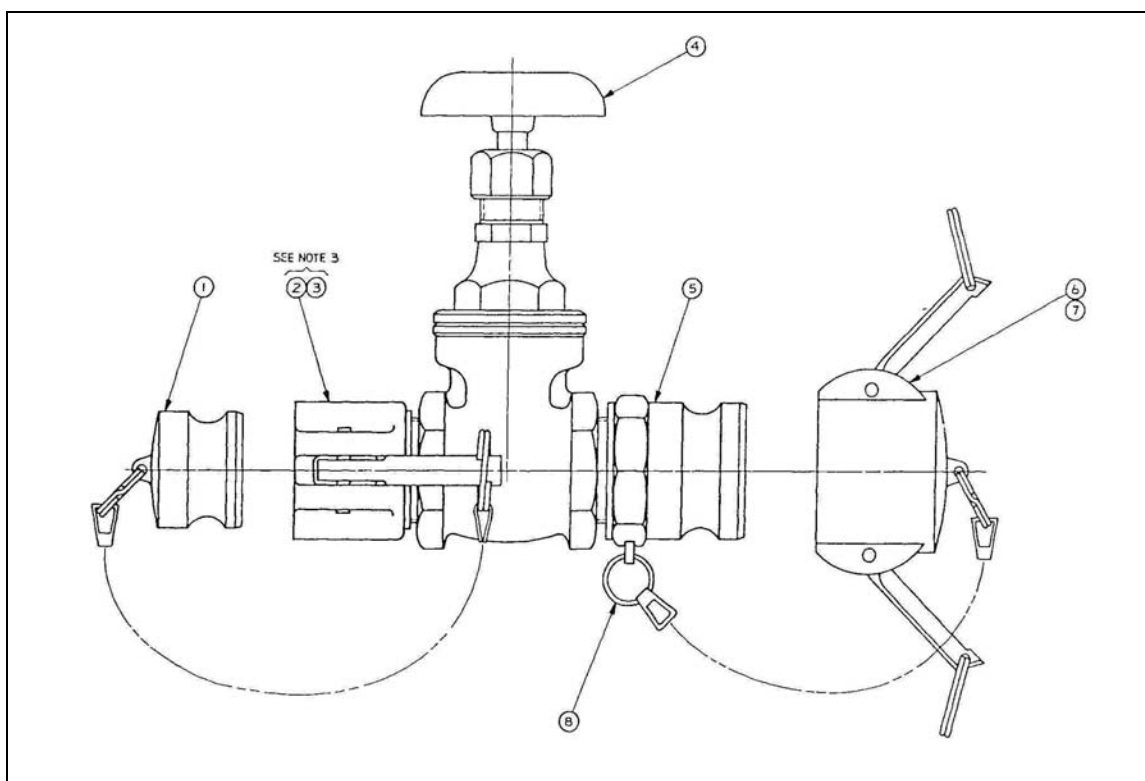
SECTION 2 – REPAIR PARTS LISTS
Valve, Gate, 2 inch female, 1½ inch male

Figure E-1



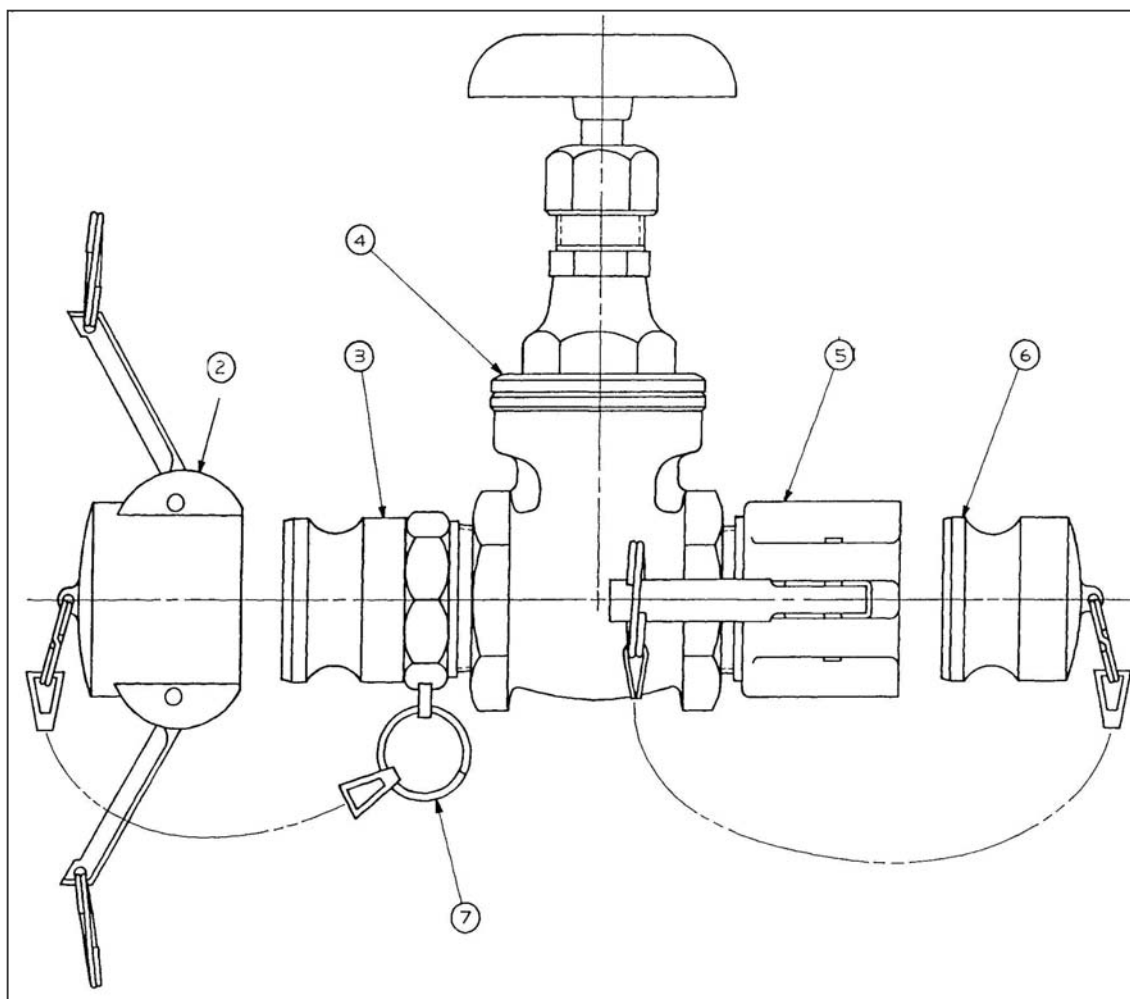
(1) FIG NO.	(2) ITEM NO.	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
1	1	4820-01-440-8306	13229E7178	Valve, Gate 2"F x 1 1/2"M	1	
1	2			Valve, Gate	1	
1	3	4730-00-915-5127		Plug, Quick Disconnect 2"	1	
1	4	5325-00-926-5411	H01434M	Retaining Ring	6	
1	5	4010-00-228-9948	RR-C-271	Chain, Weldless	V	
1	6			Coupling Half, Quick Disconnect F 2"	1	
1	7	4730-00-360-0589		Coupling Half, Quick Disconnect M 1 1/2"		
1	8	4730-00-869-5246		Cap Quick Disconnect 1 1/2"	1	
1		8030-00-889-3534	A-A-58092	Tape Antisiezing	V	

SECTION 2 – REPAIR PARTS LISTS
Valve, Gate, 1½ inch female, 2 inch male
Figure E-2



(1) FIG NO	(2) ITEM NO.	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
2		4820-01-440-8302	13229E7177	Valve, Gate 1 1/2"F x 2"M	1	EA
2	1	4730-00-869-5246	MS27028-9	Cap, Quick Disconnect	1	EA
2	2	4730-00-980-9411	MS27024-2	Coupling Half Quick Disconnect 1 1/2"F NPT	1	EA
2	3	5530-00-360-0595	MS27030-5	Gasket	1	EA
2	4	4820-01-358-2557	MSS-SP-80	Valve, Gate	1	EA
2	5	4730-00-432-7448	MS49001-9	Coupling Half Quick Disconnect 2"M w/1 1/2"M NPT	1	EA
2	6	4730-00-649-9100	MS27028-11	Cap, Quick Disconnect 2"	1	EA
2	7	5330-00-612-2414	MS27030-6	Gasket	1	EA
2	8	5325-00-926-5411	H01434M	Ring, Retaining	5	EA
2		8030-00-889-3534	A-A-58092	Tape, Antisiezing	V	AR

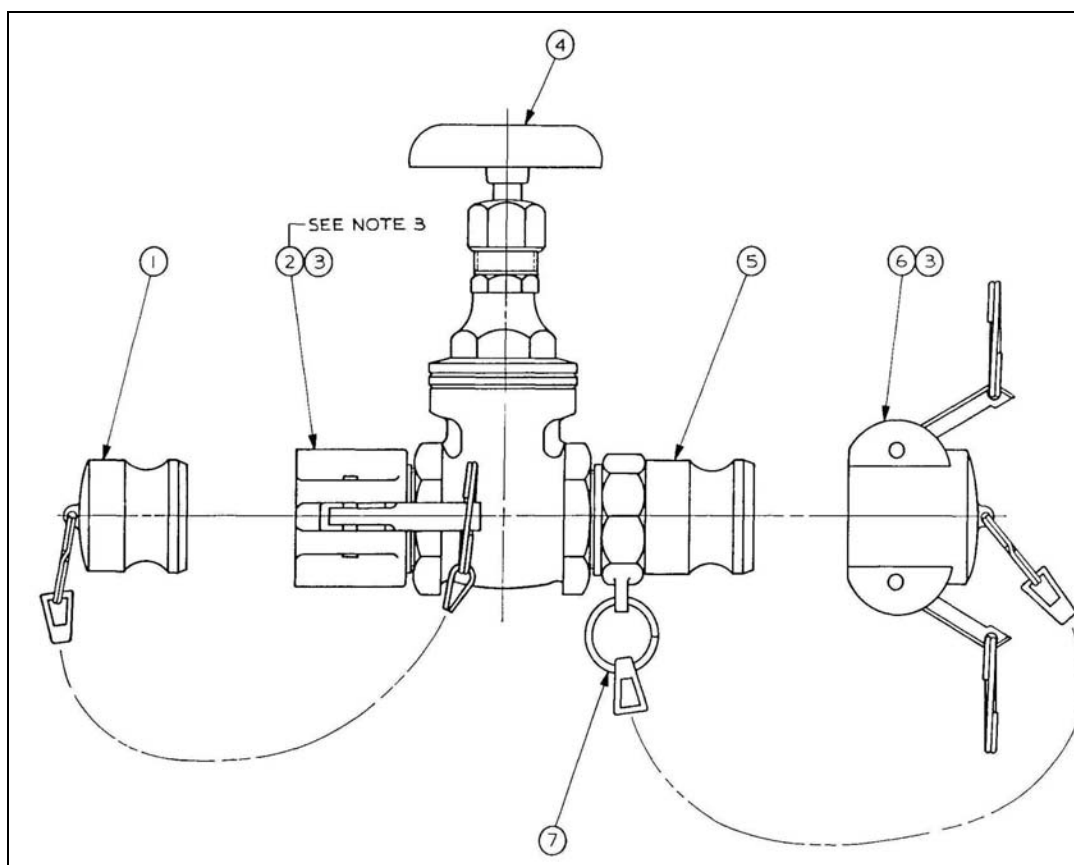
SECTION 2 – REPAIR PARTS LISTS
Valve, Globe, 1½ inch female, 1 1/2 inch male
Figure E-3



Water Distribution and Wastewater Management System (WDWWMS)

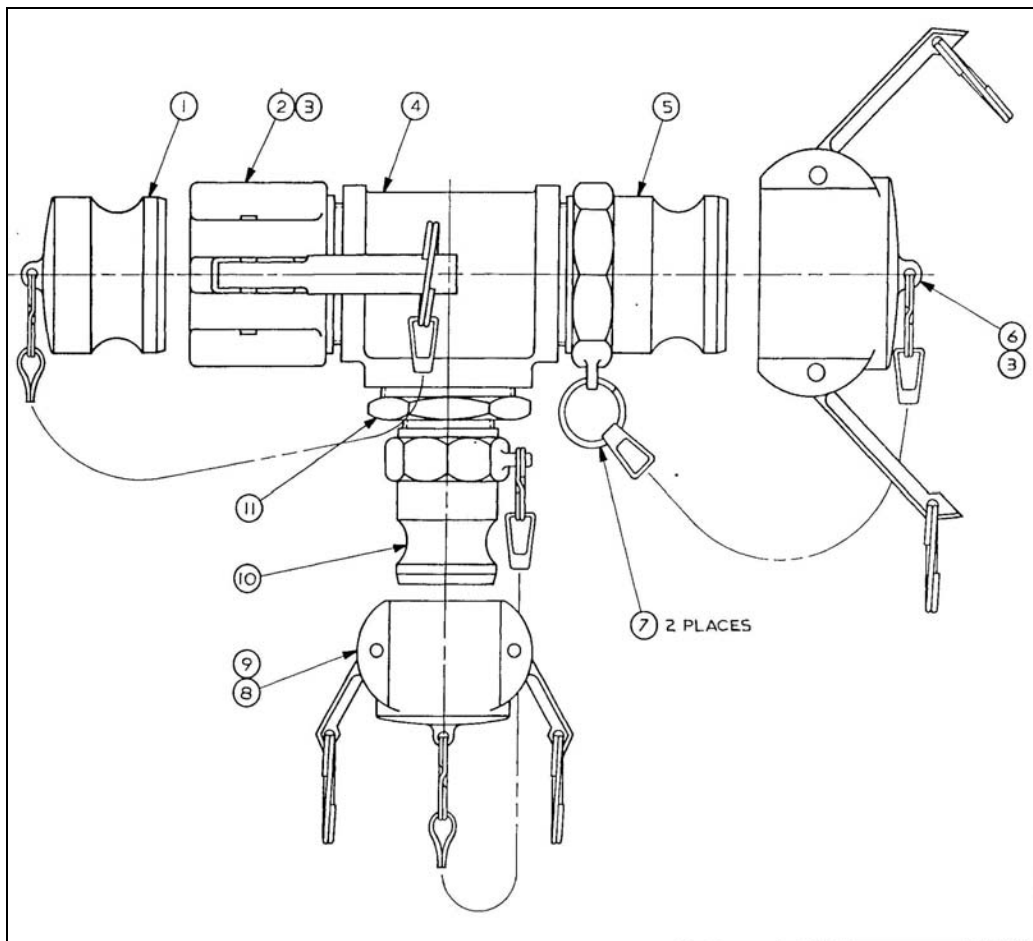
(1) FIG NO	(2) ITEM NO.	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
3	1	4820-01-440-8765	13229E7169	Valve, Globe Assembly 1 1/2"F x 1 1/2"M	1	EA
3	2	4730-00-869-5246	MS27028-9	Cap Quick Disconnect 1 1/2"	1	EA
3	3	4730-00-360-0592	MS27021-9	Coupling Half Quick Disconnect 1 1/2" M	1	EA
3	4	4820-00-262-6877	MSS-SP-80	Valve, Globe	1	EA
3	5	4730-00-980-9411	MS27024-9	Coupling Half Quick Disconnect 1 1/2" F	1	EA
3	6	4730-00-823-5316	MS27029-9	Plug, Quick Disconnect 1 1/2"	1	EA
3	7	5325-00-926-5411	H01434M	Ring Retaining	6	EA
3		8030-00-889-3534	A-A-58092	Tape Antiseizing	V	AR

SECTION 2 – REPAIR PARTS LISTS
Valve, Gate, 1 Inch Female x 1 Inch Male
Figure E-4



(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
4		4820-01-440-7798	13229E7167	Valve, Gate Assembly 1"F x 1"M	1	EA
4	1	4730-00-360-0715	MS27029-5	Plug, Quick Disconnect 1"	1	EA
4	2	4730-00-360-0710	MS27024-5	Coupling Half Quick Disconnect 1"F w/M NPT	1	EA
4	3	5330-00-088-9167	MS27030-4	Gasket	2	EA
4	4	4820-00-554-8715	WWV54	Valve, Gate	1	EA
4	5	4730-00-084-7435	MS27022-5	Coupling Half Quick Disconnect 1"M w/M NPT	1	EA
4	6	4730-00-360-0791	MS27028-5	Cap, Quick Disconnect 1"	1	EA
4	7	5325-00-926-5411	H01434M	Ring, Retaining	6	EA
4		8030-00-889-3534	A-A-58092	Tape, Antisiezing	V	AR

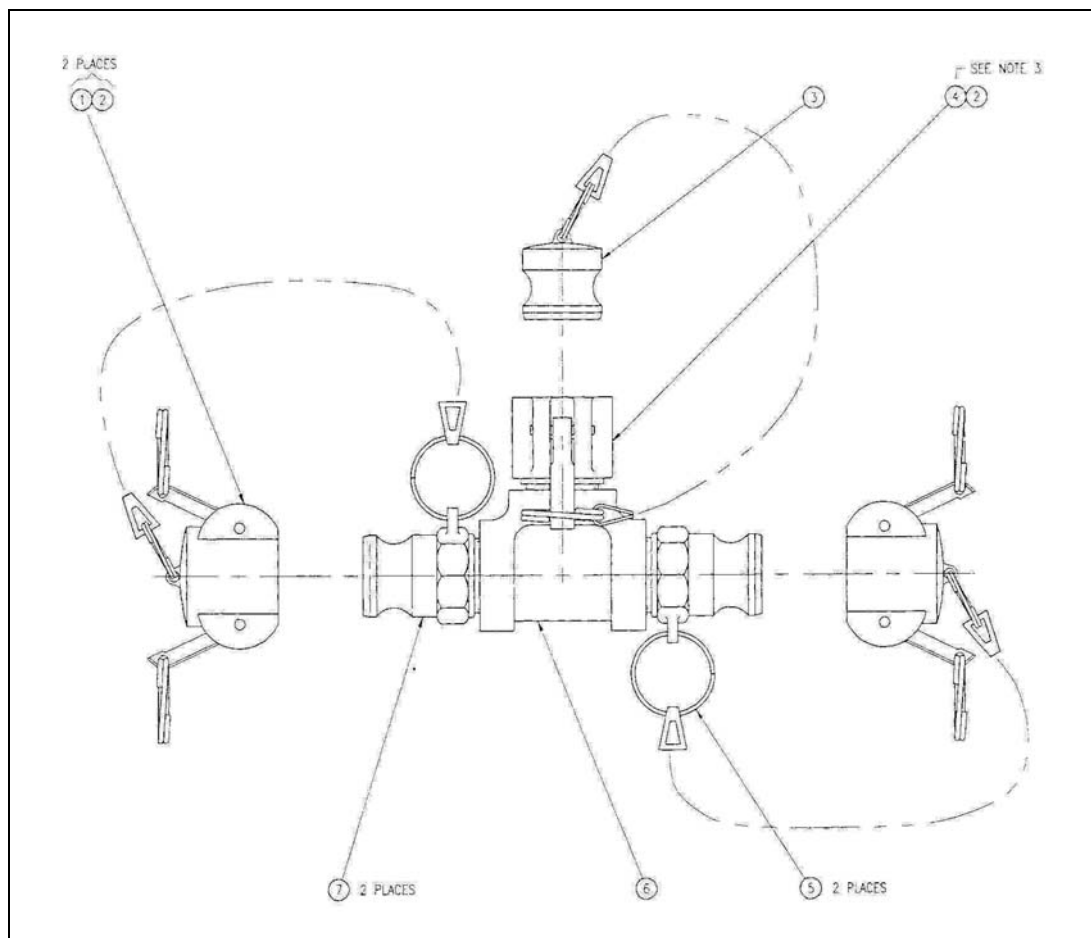
SECTION 2 – REPAIR PARTS LISTS
Tee Assembly, Quick Disconnect
1½ Inch Female x 1½ Inch Male x 1 Inch Male
Figure E-5



Water Distribution and Wastewater Management System (WDWWMS)

(1) FIG NO.	(2) ITEM NO.	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
5		4730-01-440-4609	13229E7172	Tee Assembly Quick Disconnect 1 1/2"F x 1 1/2"M x 1" M	1	AY
5	1	4730-00-823-5316	MS217029-9	Plug, Quick Disconnect, 1 1/2"	1	EA
5	2	4730-00-980-9411	MS27024-9	Coupling Half Quick Disconnect 1 1/2"F NPT	1	EA
5	3	5330-00-360-0595	MS27030-5	Gasket	2	EA
5	4	4730-01-439-9316	13229E7191-25	Tee, Pipe	1	EA
5	5	4730-00-360-0589	MS27022-9	Coupling Half Quick Disconnect 1 1/2"M NPT	1	EA
5	6	4730-00-869-5246	MS27028-9	Cap, Quick Disconnect, 1 1/2"	1	EA
5	7	5325-00-926-5411	H01434M	Ring, Retaining	9	EA
5	8	4730-00-929-0791	MS27028-5	Cap, Quick Disconnect, 1"	1	EA
5	9	5330-00-088-9167	MS27030-3	Gasket	1	EA
5	10	4730-00-084-7435	MS27022-5	Coupling Half Quick Disconnect 1 "M NPT	1	EA
5	11	4730-01-440-0076	13229E7191-23	Bushing, Pipe 1 1/2" x 1"	1	EA
5		8030-00-889-3534	A-A-58092	Tape, Antiseizing	V	AR

SECTION 2 – REPAIR PARTS LISTS
Tee Assembly, Quick Disconnect
1 Inch Female x 1 Inch Male x 1 Inch Male
Figure E-6



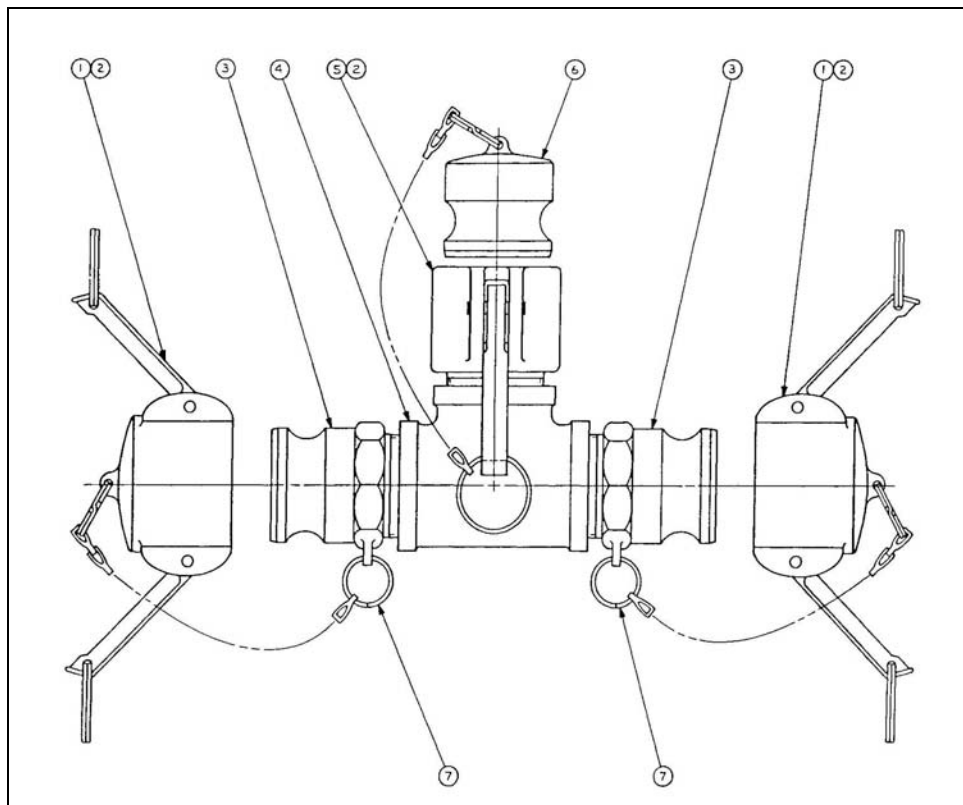
Water Distribution and Wastewater Management System (WDWWMS)

(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
6		4730-01-440-4091	13229E0361	Tee Assembly Quick Disconnect 1"F x 1"M x 1"M	1	EA
6	1	4730-00-360-0791	MS27028-5	Cap, Quick Disconnect 1"	2	EA
6	2	5330-00-088-9167	MS27030-4	Gasket	2	EA
6	3	4730-00-360-0715	MS27029-5	Plug, Quick Disconnect 1"	1	EA
6	4	4730-00-360-0710	MS27026-5	Coupling Half Quick Disconnect 1"F w/M NPT	1	EA
6	5	5325-00-926-5411	H01434M	Ring, Retaining	11	EA
6	6		M52618/1 B06XC	Tee, Pipe Straight 1"	1	EA
6	7	4730-00-084-7435	MS27022-5	Coupling Half Quick Disconnect 1"F w/M NPT	2	EA
6		8030-00-889-3534	A-A-58092	Tape, Antisiezing	V	AR

SECTION 2 – REPAIR PARTS LISTS

Tee Assembly, Quick Disconnect 1 1/2 Inch Male x 1 1/2 Inch Male x 1 1/2 Inch Female

Figure E-7



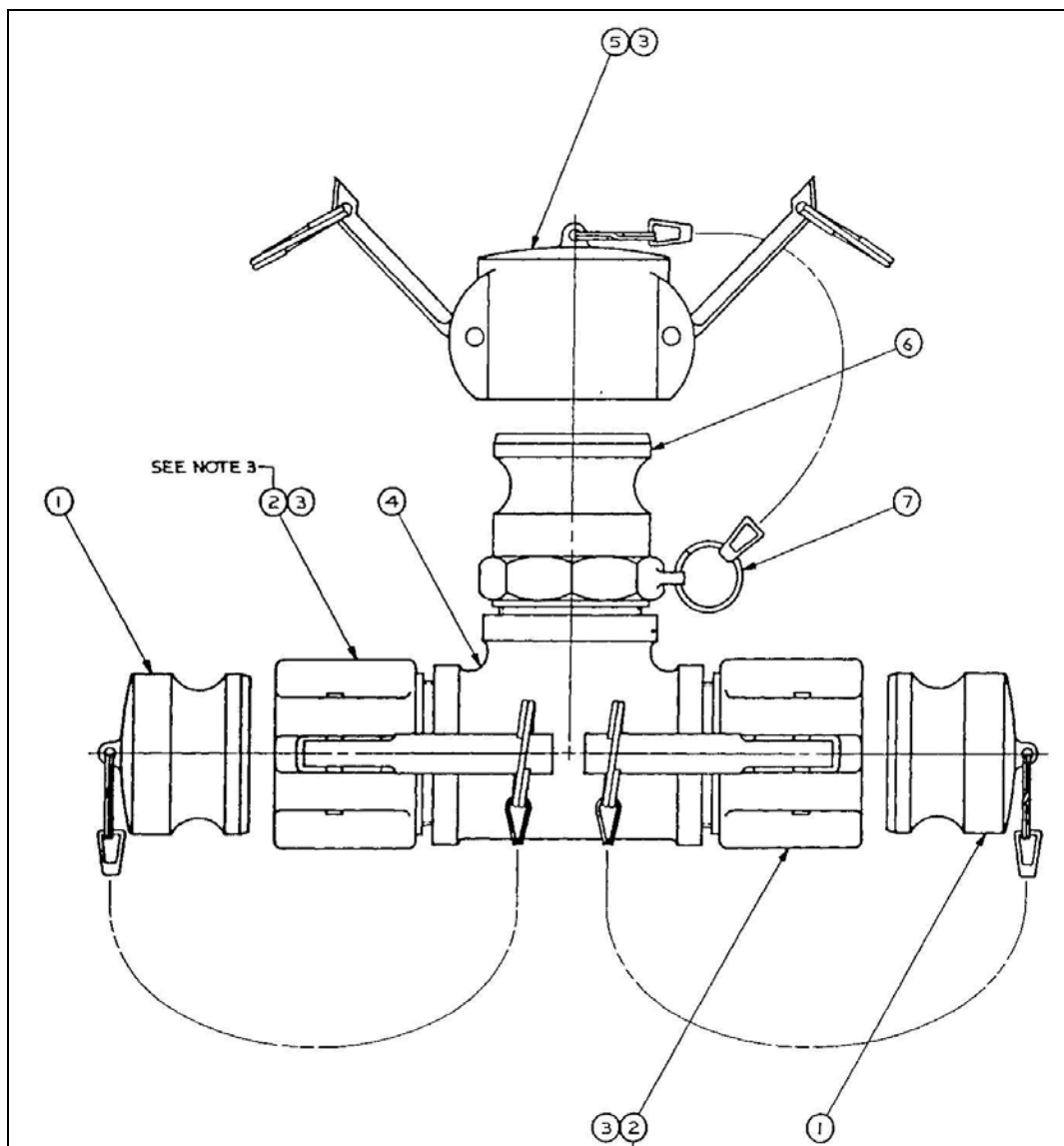
(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
7		4730-01-440-4633	13229E7182	Tee Assembly Quick Disconnect 1 1/2"M x 1 1/2"M x 1 1/2"F	1	EA
7	1	4730-00-869-5246	MS27028-9	Cap, Quick Disconnect 1 1/2"	2	EA
7	2	5330-00-360-0595	MS27030-5	Gasket	3	EA
7	3	4730-00-360-0589	MS27022-9	Coupling Half Quick Disconnect 1 1/2"M w/M NPT	2	EA
7	4	4730-01-439-9316	13229E7192	Tee, Pipe	1	EA
7	5	4730-00-980-9411	MS27024-9	Coupling Half Quick Disconnect 1 1/2"F w/M NPT	1	EA
7	6	4730-00-823-5316	MS27029-9	Plug, Quick Disconnect 1 1/2"	1	EA
7	7	5325-00-926-5411	H01434M	Ring, Retaining	11	EA
7		8030-00-889-3534	A-A-58092	Tape, Antiseizing	V	AR

SECTION 2 – REPAIR PARTS LISTS

Tee Assembly, Quick Disconnect

1 1/2 Inch Female x 1 1/2 Inch Female x 1 1/2 Inch Male

Figure E-8



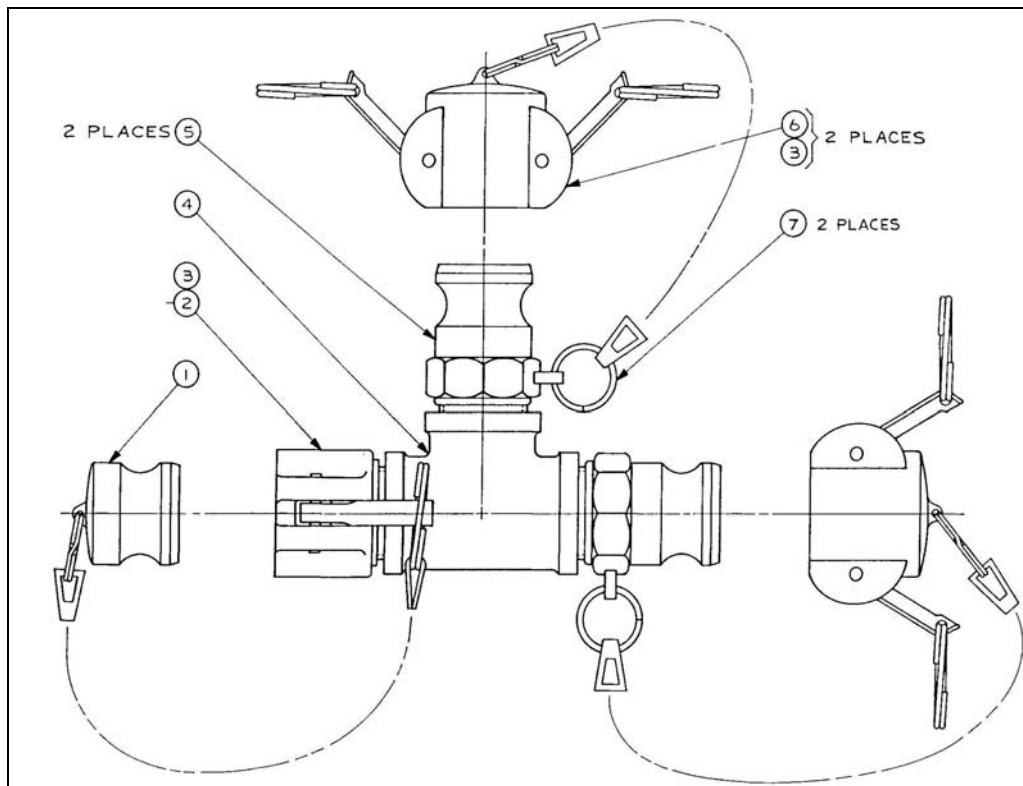
Water Distribution and Wastewater Management System (WDWWMS)

(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
8		4730-01-440-4615	13229E7181	Tee Assembly Quick Disconnect 1 1/2"F x 1 1/2"F x 1 1/2"M	1	EA
8	1	4730-00-823-5316	MS27029-9	Plug, Quick Disconnect 1 1/2"	2	EA
8	2	4730-00-203-1010	MS27026-9	Coupling Half Quick Disconnect 1 1/2"F w/M NPT	2	EA
8	3	5330-00-360-0595	MS27030-5	Gasket	3	EA
8	4	4730-01-439-9316	13229E7192	Tee, Pipe	1	EA
8	5	4730-00-869-5246	MS27028-9	Cap, Quick Disconnect 1 1/2"	1	EA
8	6	4730-00-360-0589	MS27022-9	Coupling Half Quick Disconnect 1 1/2"M w/M NPT	1	EA
8	7	5325-00-926-5411	H01434M	Ring, Retaining	8	EA
8		8030-00-889-3534	A-A-58092	Tape, Antiseizing	V	AR

SECTION 2 – REPAIR PARTS LISTS

Tee Assembly, Quick Disconnect 1 1/2 Inch Female x 1 1/2 Inch Male x 1 Inch Male

Figure E-9



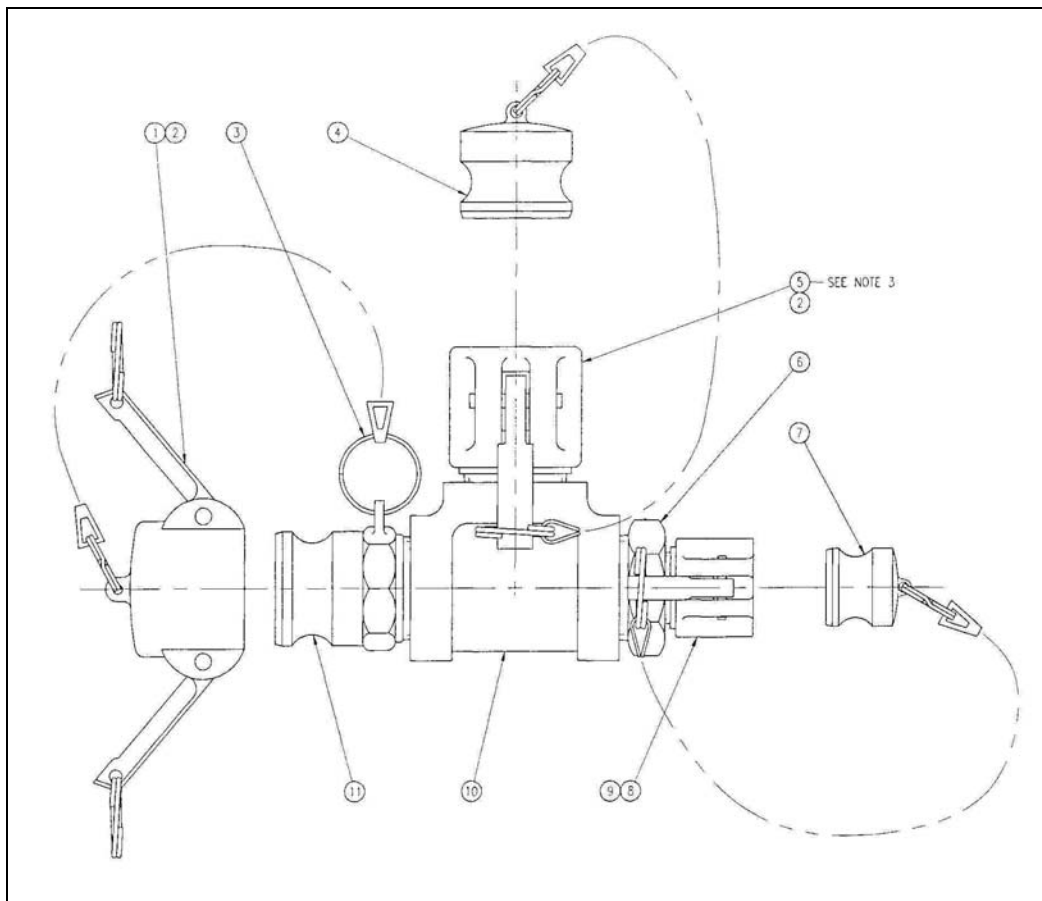
(1) FIG NO.	(2) ITEM NO.	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
9		4730-01-440-4613	13229E7174	Tee Assembly Quick Disconnect 1 1/2"F x 1 1/2"M x 1"M	1	AY
9	1	4730-00-360-0715	MS27029-5	Plug, Quick Disconnect	1	EA
9	2	4730-00-042-5265	MS27024-5	Coupling Half Quick Disconnect 1"F	1	EA
9	3	5330-00-088-9167	MS27030-3	Gasket	2	EA
9	4	4730-01-439-9291	13229E7191-19	Tee, Pipe	1	EA
9	5	4730-00-084-7435	MS27022-5	Coupling Half Quick Disconnect 1"M	2	EA
9	6	4730-00-929-0791	MS27028-5	Cap, Quick Disconnect 1"	2	EA
9	7	5325-00-926-5411	H01434M	Ring, Retaining	8	EA
9		8030-00-889-3534	A-A-58092	Tape, Antiseizing	V	AR

SECTION 2 – REPAIR PARTS LISTS

Tee Assembly, Quick Disconnect

1 1/2 Inch Male x 1 Inch Female x 1 1/2 Inch Female

Figure E-10

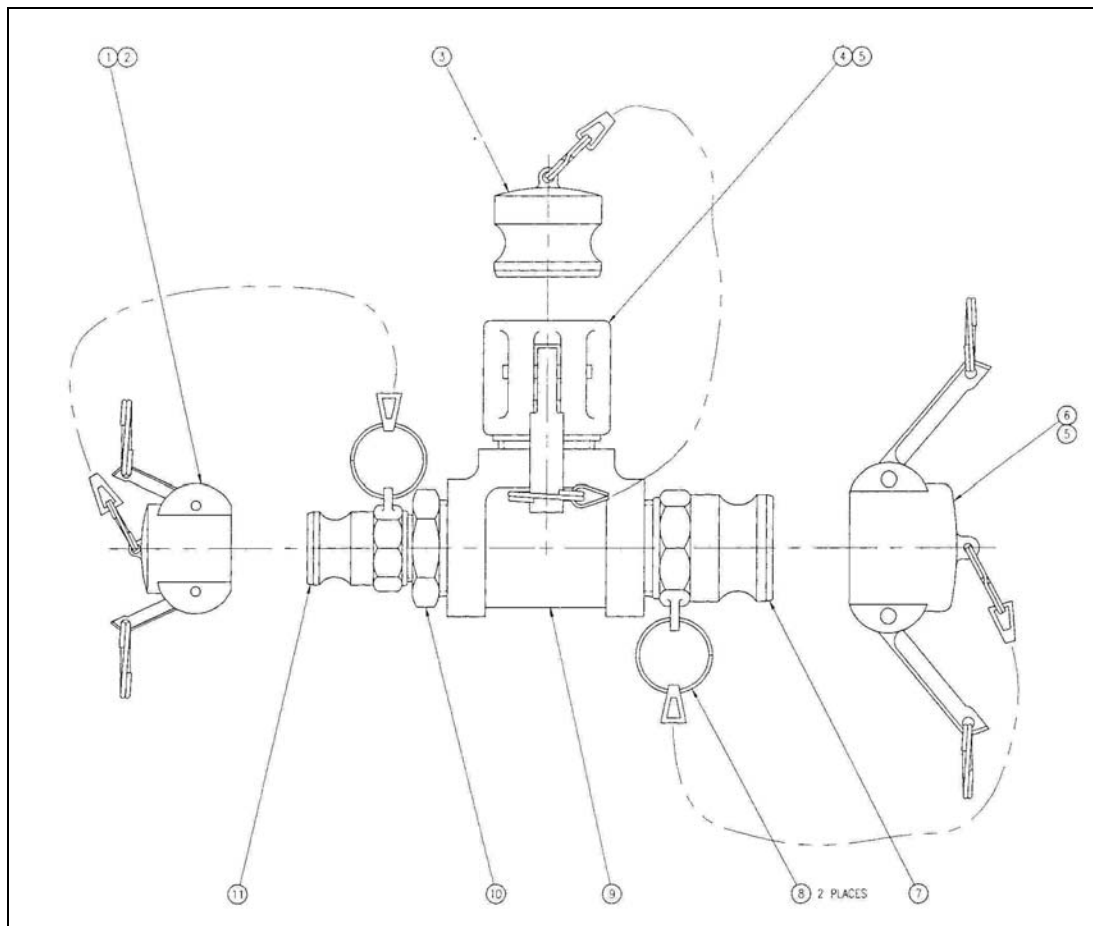


Water Distribution and Wastewater Management System (WDWWMS)

(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
10		4730-01-440-4931	13230E5716	Tee Assembly Quick Disconnect 1 1/2"M x 1"M x 1 1/2"F	1	EA
10	1	4730-00-869-5246	MS27028-9	Cap, Quick Disconnect 1 1/2"	1	EA
10	2	5330-00-360-0595	MS27030-5	Gasket	2	EA
10	3	5325-00-926-5411	H01434M	Ring, Retaining	10	EA
10	4	4730-00-823-5316	MS27029-9	Plug, Quick Disconnect 1 1/2"	1	EA
10	5	4730-00-203-1010	MS27026-9	Coupling Half Quick Disconnect 1 1/2"F w/M NPT	1	EA
10	6		MS4001-9	Reducer, Pipe	1	EA
10	7	4730-00-360-0715	MS29029-5	Plug, Quick Disconnect 1 "	1	EA
10	8	4730-00-360-0710	MS27026-5	Coupling Half Quick Disconnect 1"F w/M NPT	1	EA
10	9	5330-00-088-9167	MS27030-4	Gasket	1	EA
10	10	4730-01-439-9316	13229E7192	Tee, Pipe	1	EA
10	11	4730-00-360-0589	MS27022-9	Coupling Half Quick Disconnect 1 1/2"M w/M NPT	1	EA
10		8030-00-889-3534	A-A-58092	Tape, Antisiezing	V	AR

Tee Assembly, Quick Disconnect

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Water Distribution and Wastewater Management System (WDWWMS)

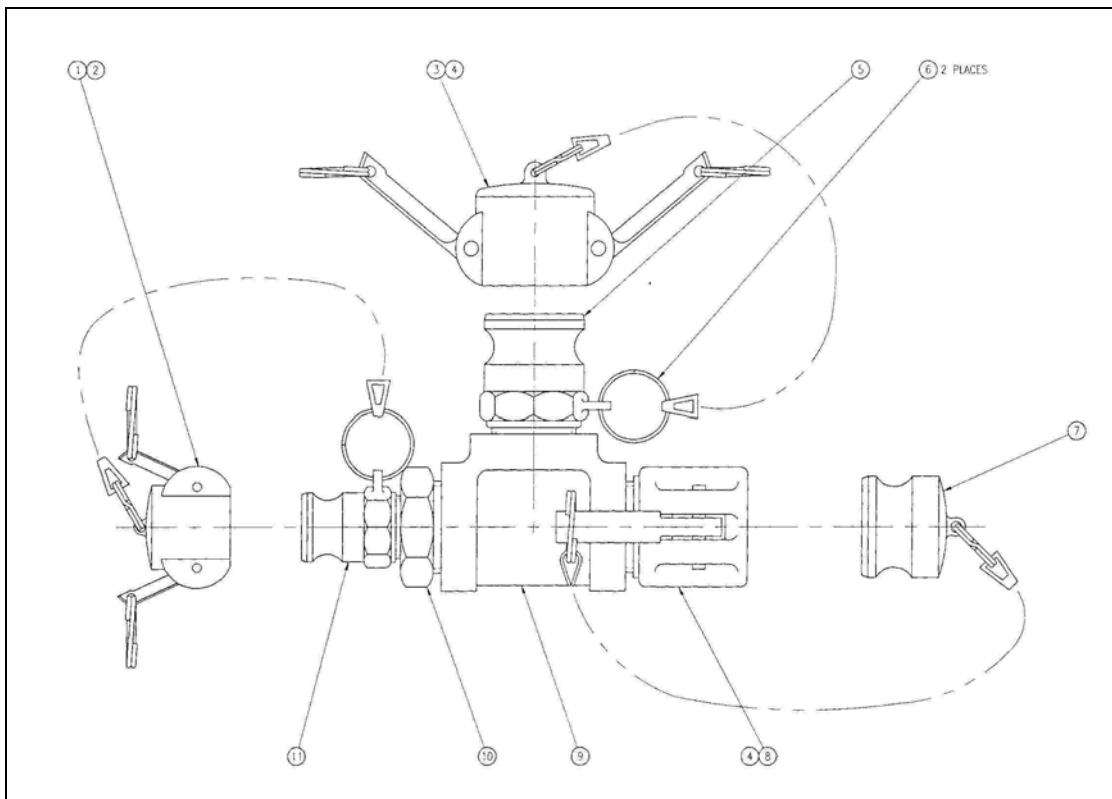
(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
11		4730-01-440-4933	13230E5717	Tee Assembly Quick Disconnect 1"M x 1 1/2"M x 1 1/2"F	1	EA
11	1	4730-00-360-0791	MS27028-5	Cap, Quick Disconnect 1 "	1	EA
11	2	5330-00-088-9167	MS27030-4	Gasket	2	EA
11	3	4730-00-823-5316	MS27029-9	Plug, Quick Disconnect 1 1/2"	1	EA
11	4	4730-00-203-1010	MS27026-9	Coupling Half Quick Disconnect 1 1/2"F w/M NPT	1	EA
11	5	5330-00-360-0595	MS27030-5	Gasket	2	EA
11	6	4730-00-869-5246	MS27028-9	Cap, Quick Disconnect 1 1/2"	1	EA
11	7	4730-00-360-0589	MS27022-9	Coupling Half Quick Disconnect 1 1/2"M w/M NPT	1	EA
11	8	5325-00-926-5411	H01434M	Ring, Retaining	11	EA
11	9	4730-01-439-9316	13229E7192	Tee, Pipe	1	EA
11	10		MS4001-9	Reducer, Pipe	1	EA
11	11	4730-00-084-7435	MS27022-5	Coupling Half Quick Disconnect 1"M w/M NPT	1	EA
11		8030-00-889-3534	A-A-58092	Tape, Antisiezing	V	AR

SECTION 2 – REPAIR PARTS LISTS

Tee Assembly, Quick Disconnect

1 Inch Male x 1 1/2 Inch Female x 1 1/2 Inch Male

Figure E-12



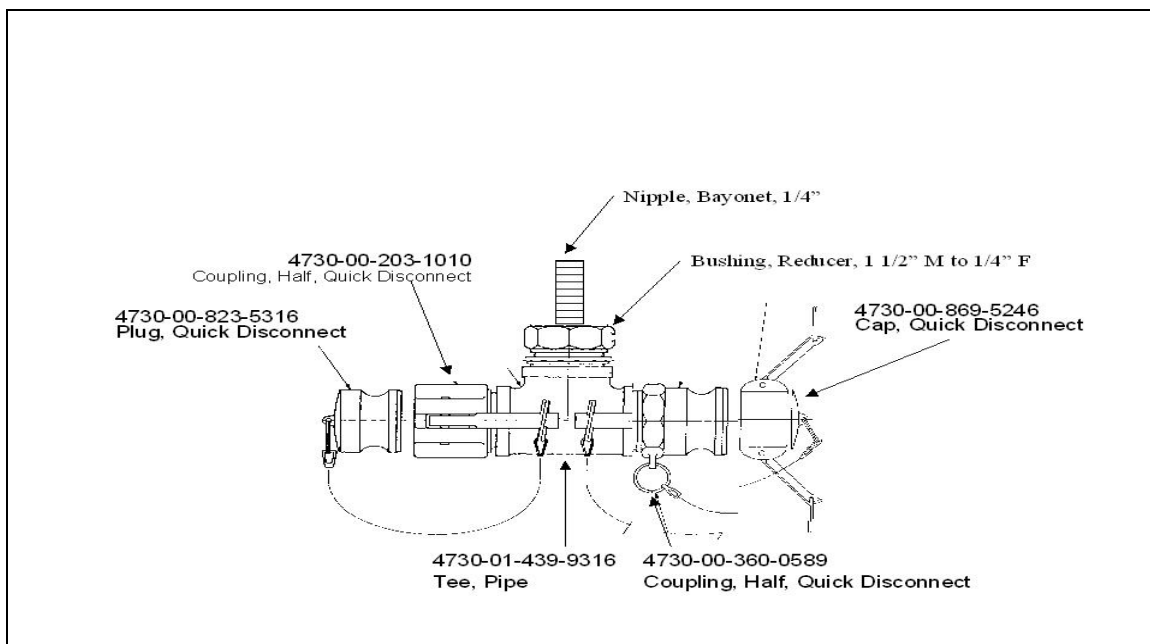
Water Distribution and Wastewater Management System (WDWWMS)

(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
12		4730-01-440-4938	13230E5717	Tee Assembly Quick Disconnect 1 "M x 1 1/2"F x 1 1/2"M	1	EA
12	1	4730-00-360-0791	MS27028-5	Cap, Quick Disconnect 1"	1	EA
12	2	5330-00-088-9167	MS27030-4	Gasket	1	EA
12	3	4730-00-823-5316	MS27029-9	Plug, Quick Disconnect 1 1/2"	1	EA
12	4	4730-00-203-1010	MS27026-9	Coupling Half Quick Disconnect 1 1/2"F w/M NPT	1	EA
12	5	5330-00-360-0595	MS27030-5	Gasket	2	EA
12	6	4730-00-869-5246	MS27028-9	Cap, Quick Disconnect 1 1/2"	1	EA
12	7	4730-00-360-0589	MS27022-9	Coupling Half Quick Disconnect 1 1/2"M w/M NPT	1	EA
12	8	5325-00-926-5411	H01434M	Ring, Retaining	11	EA
12	9	4730-01-439-9316	13229E7192	Tee, Pipe	1	EA
12	10		MS4001-9	Reducer, Pipe	1	EA
12	11	4730-00-084-7435	MS27022-5	Coupling Half Quick Disconnect 1"M w/M NPT	1	EA
12		8030-00-889-3534	A-A-58092	Tape, Antisiezing	V	AR

SECTION 2 – REPAIR PARTS LISTS

Tee Assembly, Quick Disconnect 1 1/2 Inch Female x 1 1/2 Inch Male x 1/4 Inch Male

Figure E-13

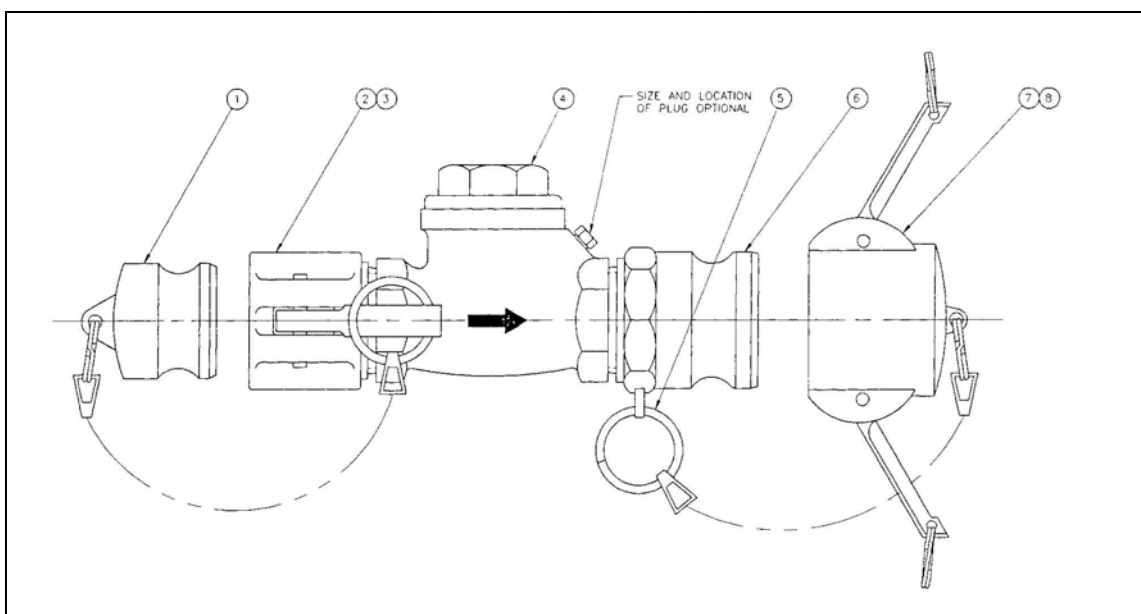


(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
13		4730-01-487-3575		Tee Assembly Quick Disconnect 1 1/2"F x 1 1/2"M 1/4"M	1	EA
13		4730-00-823-5316	MS27029-9	Plug, Quick Disconnect 1 1/2"	1	EA
13		4730-00-203-1010	MS27026-9	Coupling Half Quick Disconnect 1 1/2"F w/M NPT	1	EA
13		4730-01-439-9316	13229E7192	Tee, Pipe	1	EA
13		4730-00-360-0589	MS27022-9	Coupling Half Quick Disconnect w/M NPT	1	EA
13		4730-00-869-5246	MS27028-9	Cap, Quick Disconnect 1 1/2"	1	EA
13				Bushing, Reducer 1 1/2"M to 1/4" F	1	EA
13		5330-00-360-0595	MS27030-5	Gasket	2	EA
13		5325-00-926-5411	H01434M	Ring, Retaining	7	EA
13		8030-00-889-3534	A-A-58092	Tape, Antisiezing	V	AR

SECTION 2 – REPAIR PARTS LISTS

Valve, Check

Figure E14

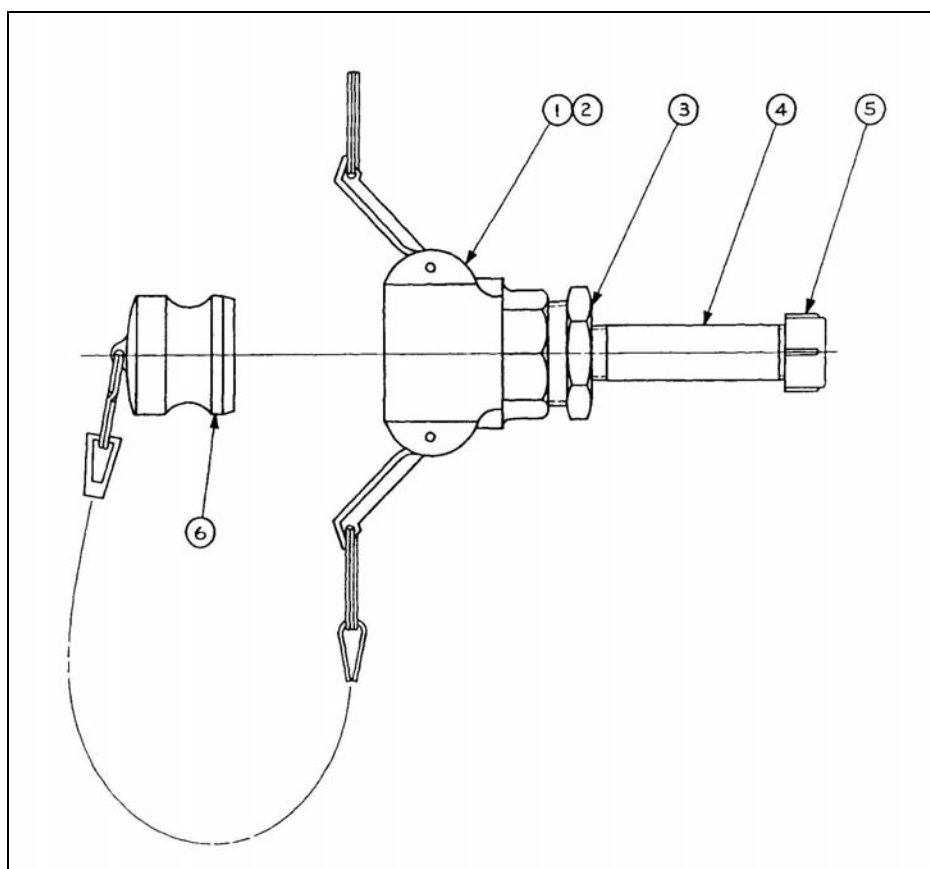


(1) FIG NO	(2) ITEM NO.	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
14	1	4820-01-440-5919	13229E7197	Valve, Check	1	AY
14	2	4730-00-823-5316	MS27029-9	Plug, Quick Disconnect 1 1/2"	1	EA
14	3	4730-00-980-9411	MS27024-9	Coupling, Quick Disconnect 1 1/2" F	1	EA
14	4	4730-01-440-0038	13229E7191	Tee, Pipe	1	EA
14	5	5325-00-926-5411	H01434M	Ring, Retaining	6	EA
14	6	4730-00-432-7448	MS49001-9	Coupling, Quick Disconnect 2"M	1	EA
14	7	4730-00-649-9100	MS27028-11	Cap, Quick Disconnect 2"	1	
14		8030-00-889-3534	A-A-58092	Tape, Antisiezing	V	AR

SECTION 2 – REPAIR PARTS LISTS

Plug Quick Disconnect

Figure E15

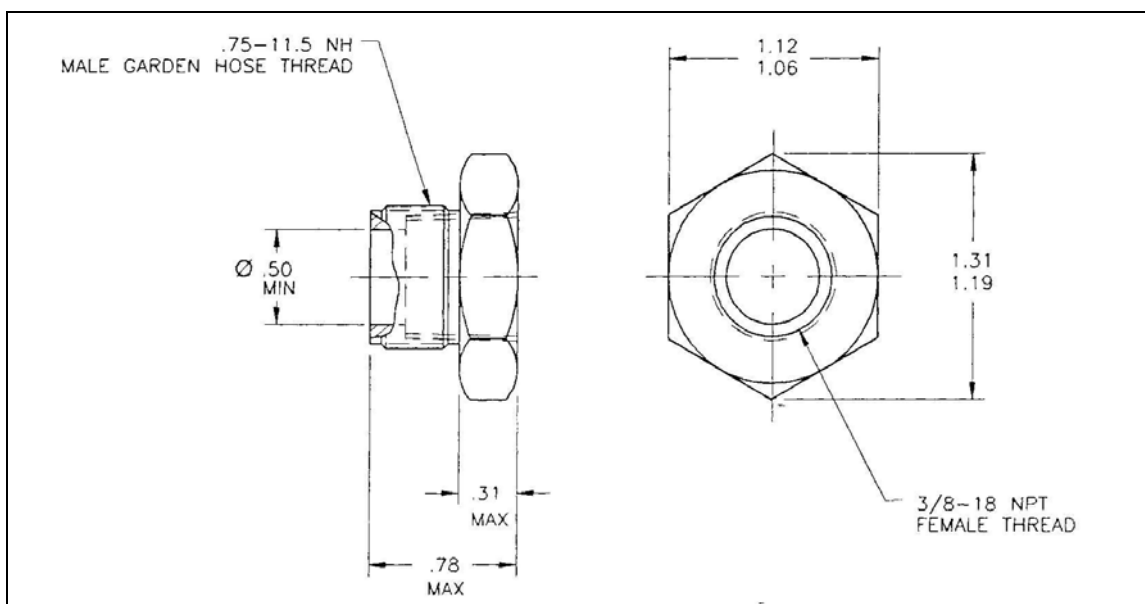


(1) FIG NO.	(2) ITEM NO.	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
15	1	4730-01-415-6403	13229E7170	Plug Quick Disconnect	1	EA
15	2	4730-00-980-9411	MS27024-9	Coupling Half Quick Disconnect 1 1/2"F w/NPT	1	EA
15		5330-00-088-9167	MS27030-3	Gasket	1	EA
15	3	4730-00-858-3490	MIL-F-52618/8	Bushing, Pipe	1	EA
15	4		13229E7193-1	Nipple, Pipe	1	EA
15	5	5340-00-804-5230	MIL-C-5501/6	Cap, Protective	1	EA
15	6	4730-00-649-9100	13229E7191-13	Cap, Quick Disconnect, 2"	1	EA
15		8030-00-889-3534	A-A-58092	Tape, Antisiezing	V	AR
15		5325-00-926-5411	H01434M	Ring, Retaining	3	EA

SECTION 2 – REPAIR PARTS LISTS

Adapter, Straight Hose to Boss

Figure E16

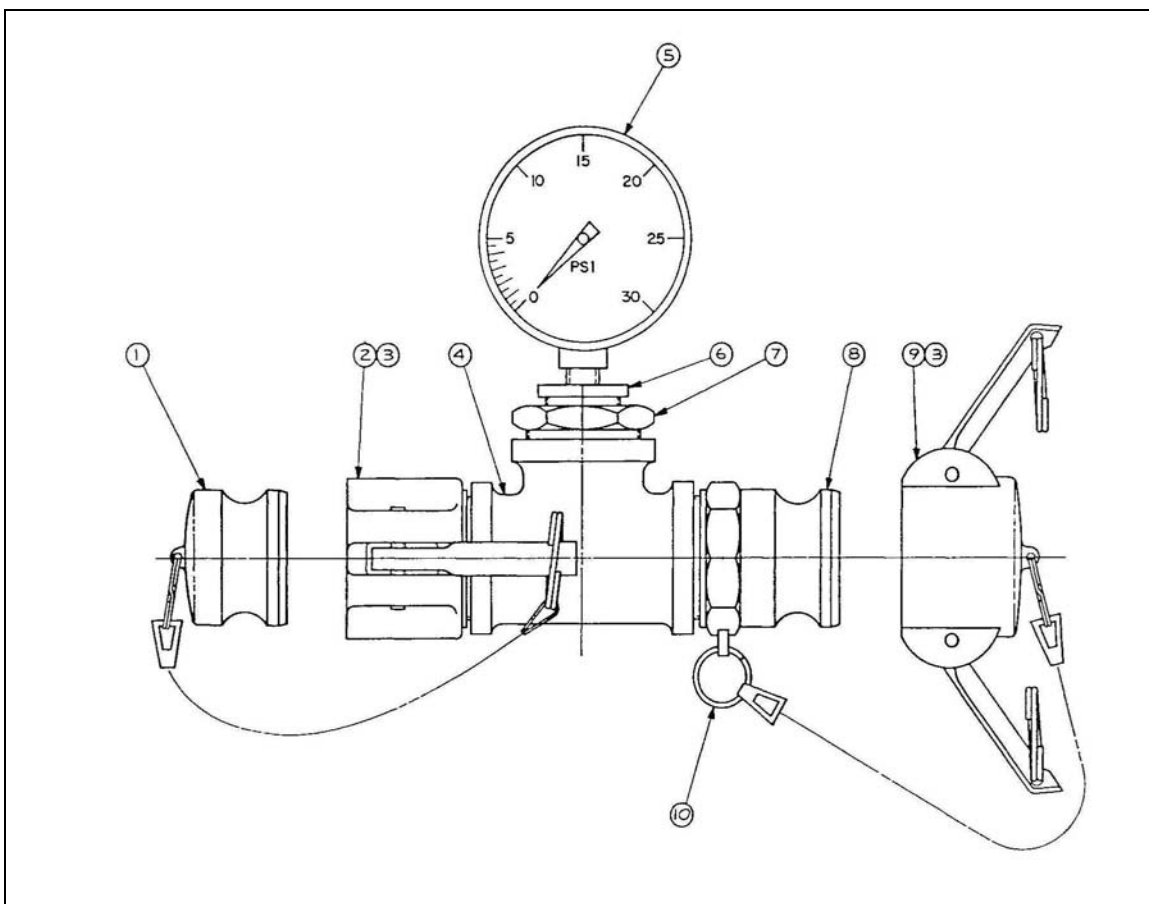


(1) FIG NO.	(2) ITEM NO.	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
16	1	4730-01-415-6420	13229E7195	Adapter, Straight Hose to Boss	1	

SECTION 2 – REPAIR PARTS LISTS

Pipe Assembly, Potable Water

Figure E17



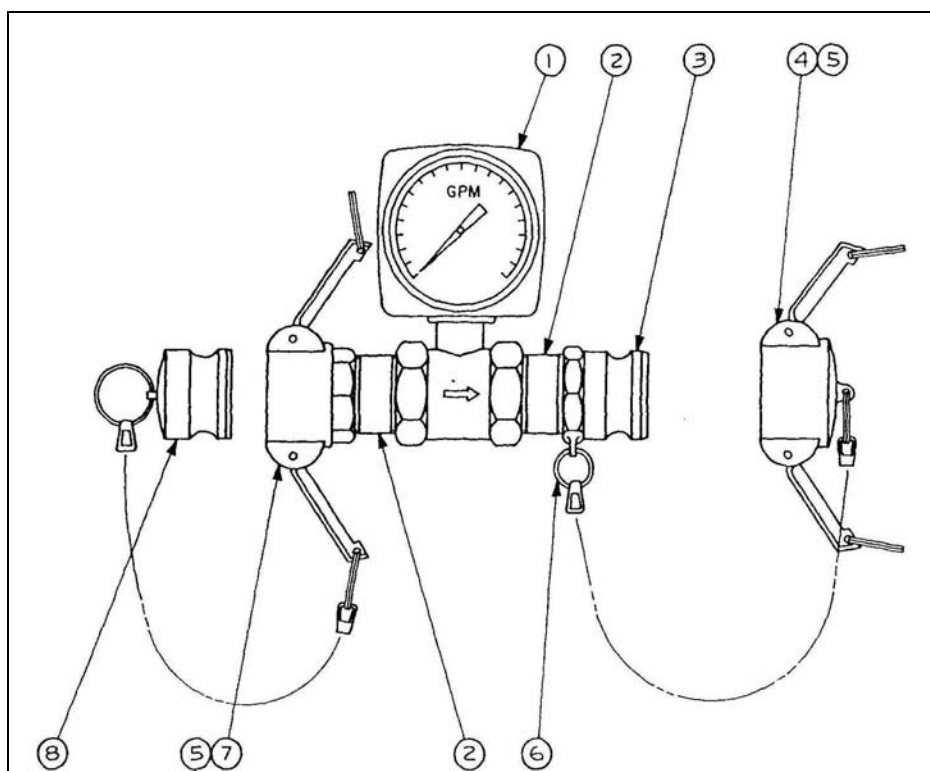
Water Distribution and Wastewater Management System (WDWWMS)

(1) FIG NO.	(2) ITEM NO.	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
17		4610-01-440-4086	13229E7162	Pipe Assembly, Potable Water	1	EA
17	1	4730-00-968-5246	MS27028-9	Cap, Quick Disconnect 1 1/2"	1	EA
17	2	4730-00-203-1010	MS27026-9	Coupling Half Quick Disconnect 1 1/2"F w/M NPT	1	EA
17	3	5330-00-360-0595	MS27030-5	Gasket	2	EA
17	4	4730-01-440-0038	13229E7191	Tee, Pipe	1	EA
17	5			Gauge, Pressure Dial, 0-30 PSI	1	EA
17	6			Bushing, Pipe Reducer	1	EA
17	7	4730-00-196-0899	WWP471	Bushing, Pipe 1 1/2" x 1"	1	EA
17	8	4730-00-360-0589	MS27022-9	Coupling Half Quick Disconnect 1 1/2" M w/M NPT	1	EA
17	9	4730-00-360-0589	MS27022-9	Coupling Half Quick Disconnect 1 1/2"M w/M NPT	1	EA
17	10	5325-00-926-5411	H01434M	Ring, Retaining	7	EA
17		8030-00-889-3534	A-A-58092	Tape, Antisiezing	V	AR

SECTION 2 – REPAIR PARTS LISTS

Pipe Assembly, Potable Water

Figure E18

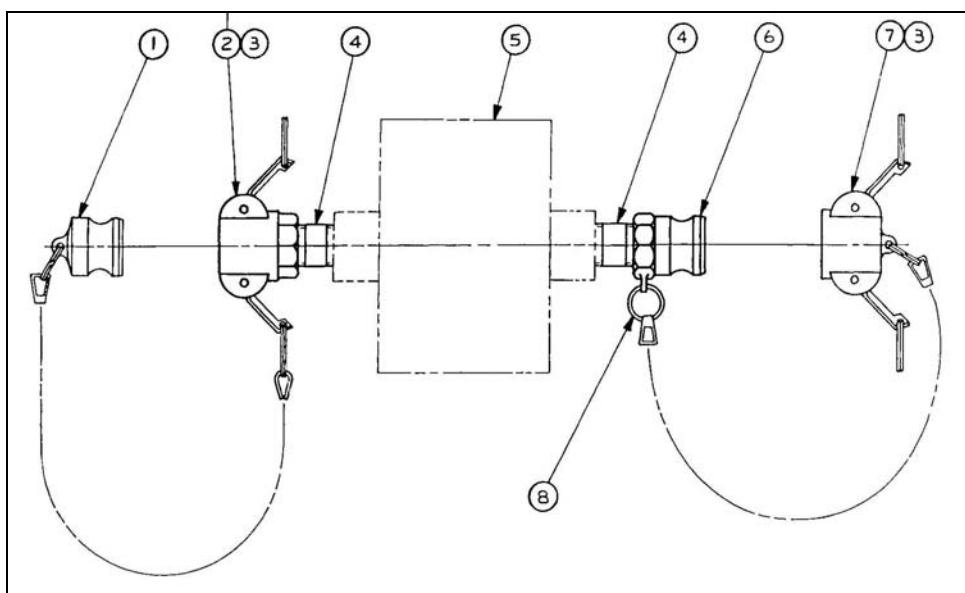


(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
18		4610-01-440-4088	13229E7165	Pipe Assembly Potable Water	1	AY
18	1			Flowmeter	1	EA
18	2			Tee, Pipe	1	EA
18	3	4730-00-360-0589	MS27022-9	Coupling Half Quick Disconnect 1 1/2"M w/M NPT	1	EA
18	4	4730-00-869-5246	MS27028-9	Cap, Quick Disconnect 1 1/2"	1	EA
18	5	5330-00-360-0595	MS27030-5	Gasket	2	EA
18	6	5325-00-926-5411	H01434M	Ring, Retaining	7	EA
18	7	4730-00-203-1010	MS27026-9	Coupling Half Quick Disconnect 1 1/2"F w/M NPT	1	EA
18	8	4730-00-823-5316	MS27029-9	Plug, Quick Disconnect 1 1/2"	1	EA
18		8030-00-889-3534	A-A-58092	Tape, Antisiezing	V	AR

SECTION 2 – REPAIR PARTS LISTS

Indicator Assembly

Figure E-19

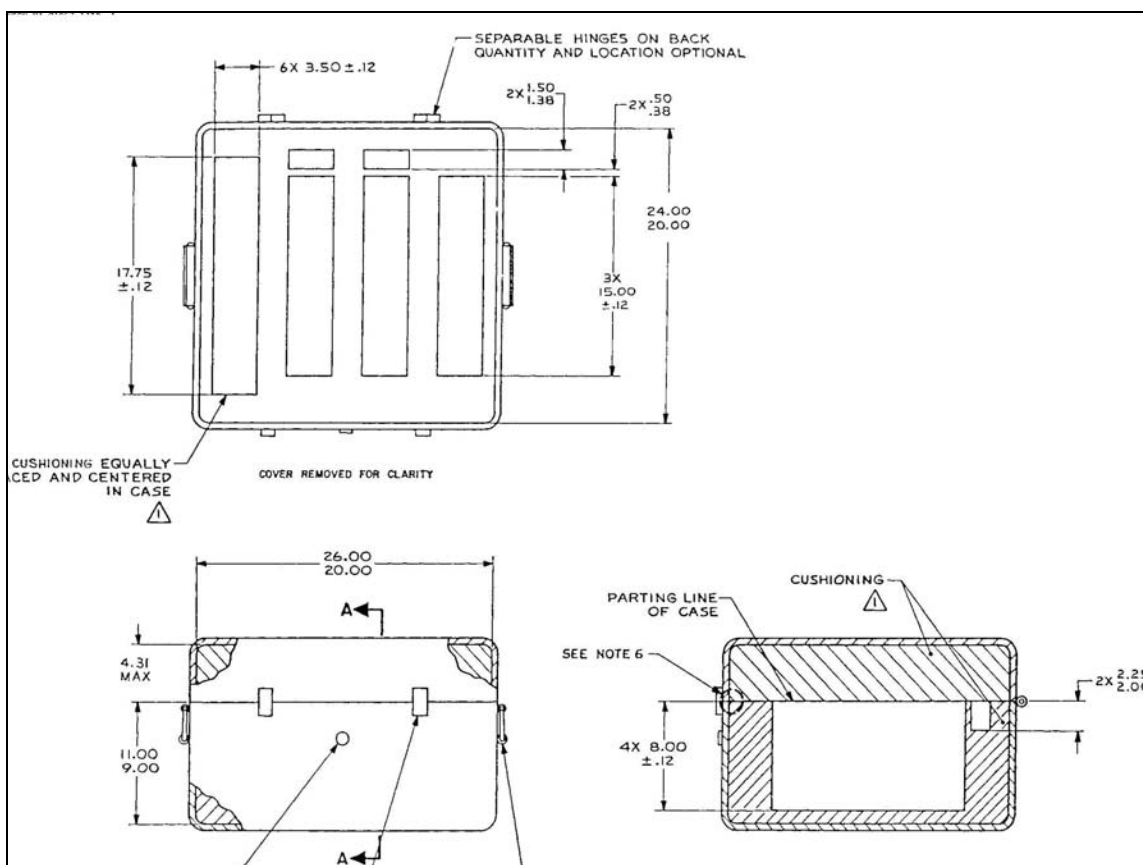


(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
19		4610-01-440-4090	13229E7163	Indicator Assembly	1	AY
19	1	4730-00-823-5316	MS27029-9	Plug, Quick Disconnect 1 1/2"	1	EA
19	2	4730-00-203-1010	MS27026-9	Coupling Half Quick Disconnect 1 1/2"F w/M NPT	1	EA
19	3	5330-00-360-0595	MS27030-5	Gasket	2	EA
19	4	4730-01-440-0076	13229E7191-23	Bushing, Pipe 1 1/2" to 1"	2	EA
19	5			Indicator	1	EA
19	6	4730-00-360-0589	MS27022-9	Coupling Half Quick Disconnect 1 1/2"M w/M NPT	1	EA
19	7	4730-00-869-5246	MS27028-9	Cap, Quick Disconnect 1 1/2"	1	EA
19	8	5325-00-926-5411	H01434M	Ring, Retaining	7	EA
19		8030-00-889-3534	A-A-58092	Tape, Antiseizing	V	AR

SECTION 2 – REPAIR PARTS LISTS

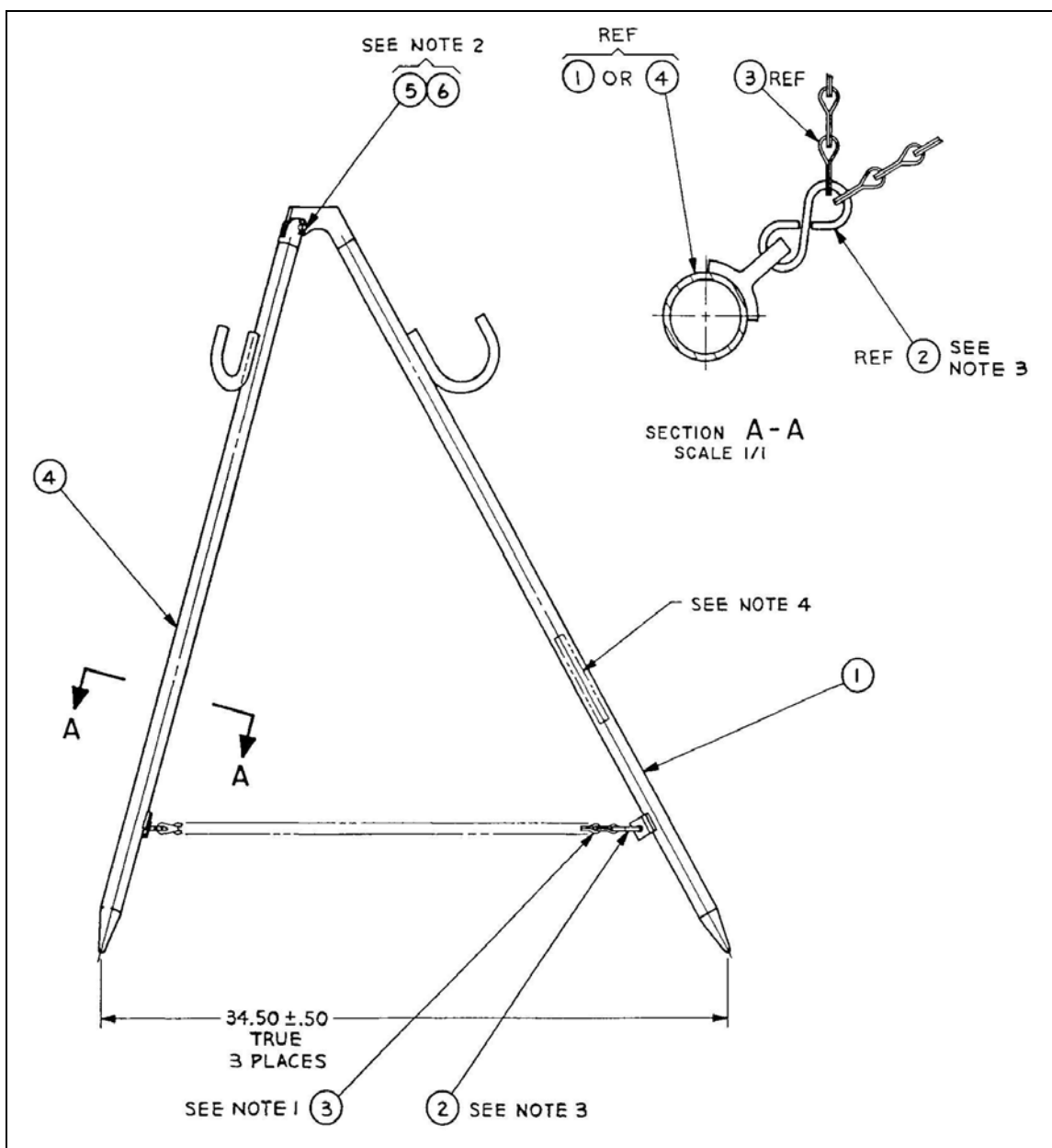
Case, Electrical-Electronic Test

Figure E-20



(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
20	1	6625-01-449-2857	13229E7189	Case, Electrical-Electronic Test	1	EA

SECTION 2 – REPAIR PARTS LISTS
Stand Assembly, Distribution Nozzle
Figure E-21

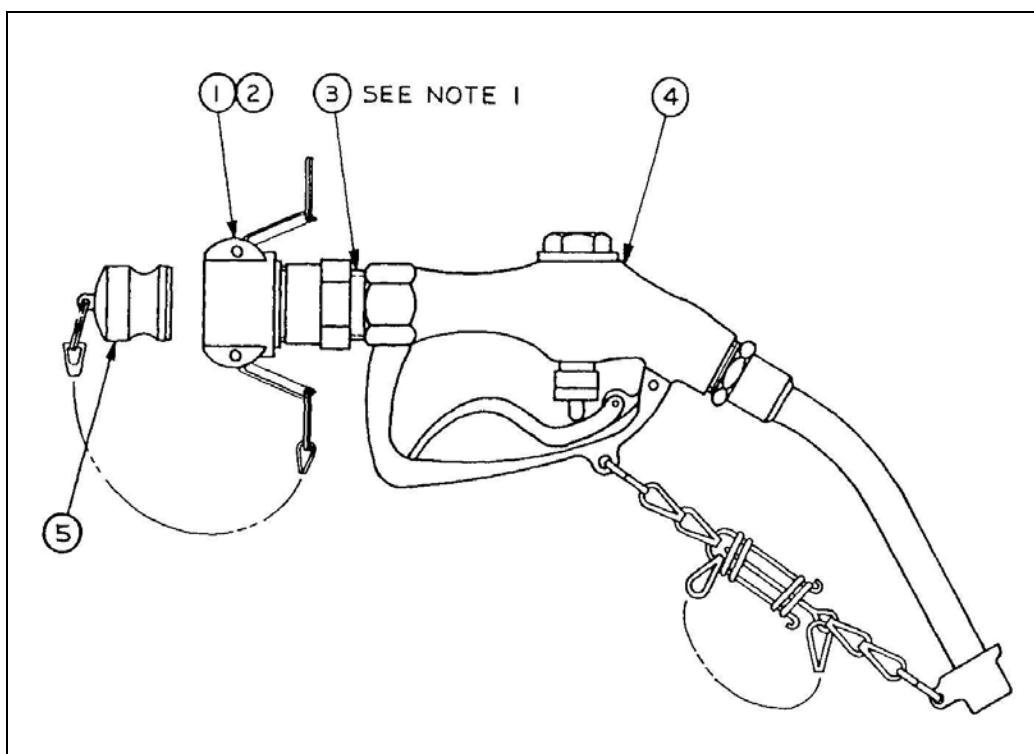


(1) FIG NO.	(2) ITEM NO.	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
21	1	4930-01-120-7426	13225E9140	Stand Assembly Distribution Nozzle	1	EA

SECTION 2 – REPAIR PARTS LISTS

Nozzle Assembly, Water

Figure E-22

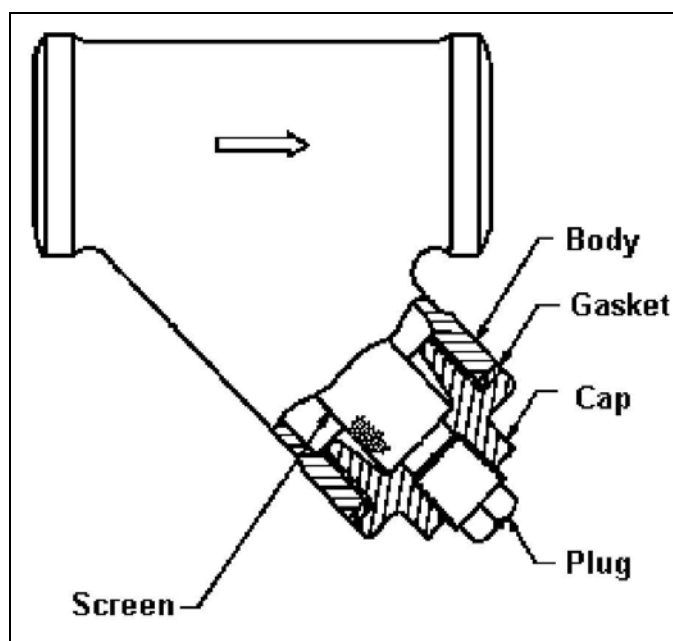
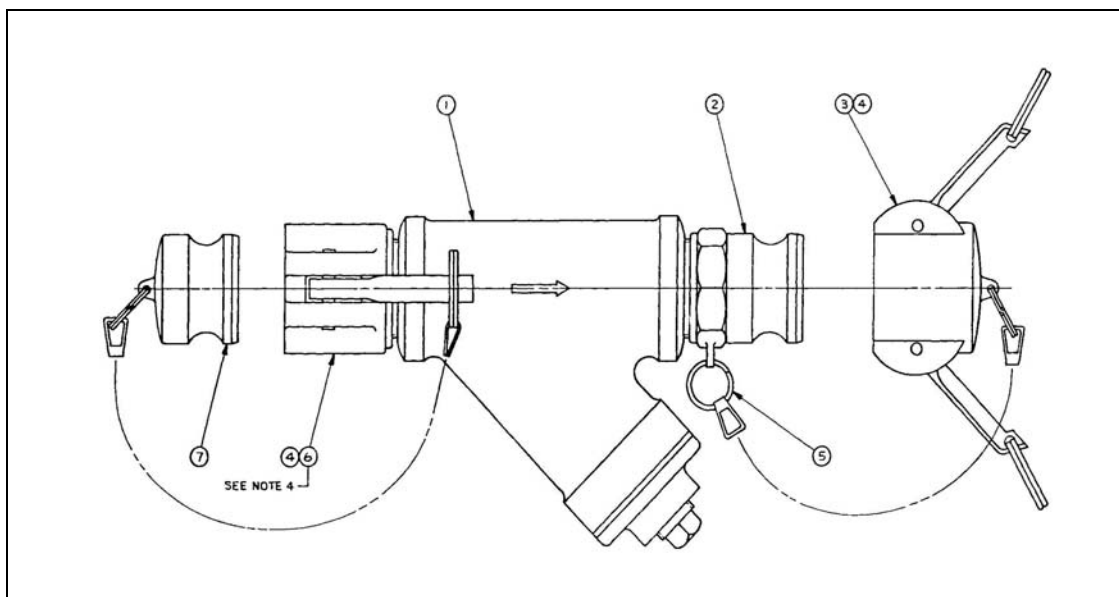


(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO	(5) DESCRIPTION	(6) QTY	(7) UI
22		4610-01-440-6834	13229E7168	Nozzle Assembly Water	1	AY
22	1	4730-00-042-5265	MS27024-5	Coupling Half Quick Disconnect 1"F w/F NPT	1	EA
22	2	5330-00-088-9167	MS27030-4	Gasket	1	EA
22	3			Bushing Pipe	1	EA
22	4			Nozzle, Water	1	EA
22		8030-00-889-3535		Tape, Antiseizing	V	AR

SECTION 2 – REPAIR PARTS LISTS

Strainer, Sediment

Figure E-23



Water Distribution and Wastewater Management System (WDWWMS)

(1) FIG NO	(2) ITEM NO.	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
23		4730-01-440-7662	13229E7180	Strainer Assembly	1	EA
23	1	4730-01-440-9103	13229E7179	Strainer, Sediment	1	EA
23	2	4730-00-360-0589	MS27022-9	Coupling Half Quick Disconnect 1 1/2"M NPT	1	EA
23	3	4730-00-869-5246	MS27028-9	Cap, Quick Disconnect 1 1/2"	1	EA
23	4	5330-00-360-0595	MS27030-5	Gasket	1	EA
23	5	5325-00-926-5411	H01434M	Ring, Retaining	5	EA
23	6	4730-00-980-9411	MS27024-9	Coupling Half Quick Disconnect 1 1/2"F NPT	1	EA
23	7	4730-00-823-5316	MS27029-9	Plug, Quick Disconnect 1 1/2"	1	EA
23		8030-00-889-3534	A-A-58092	Tape, Antiseizing	V	AR

SECTION 2 – REPAIR PARTS LISTS

Cage, Wire, Folding

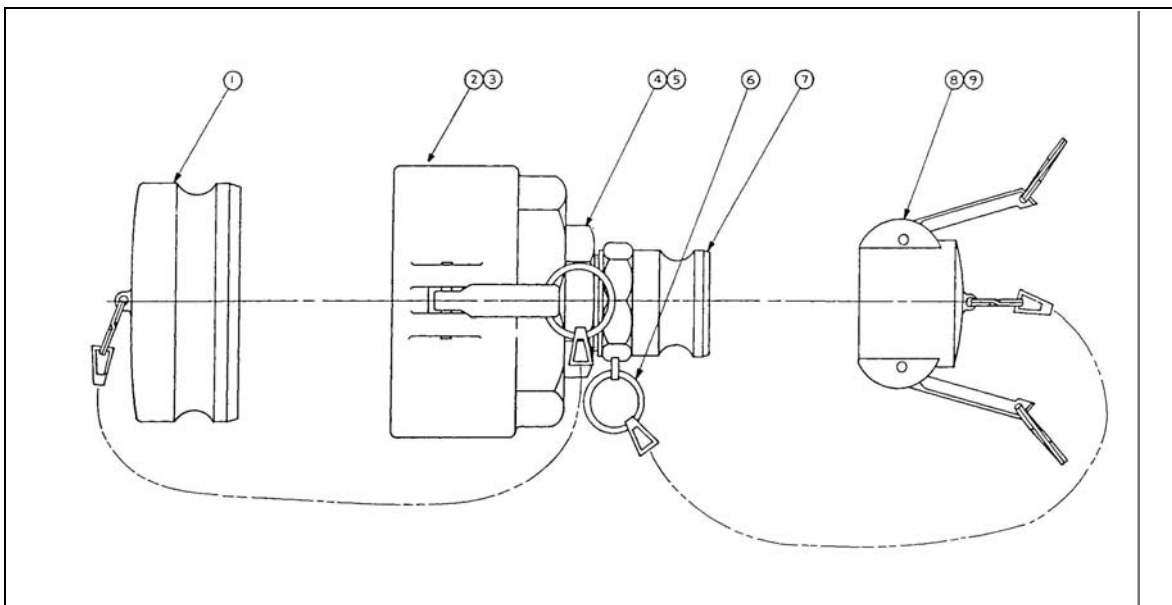
Figure E-24



(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
24	1	TBD		Cage, Wire Folding	1	EA

SECTION 2 – REPAIR PARTS LISTS

**Adapter Assembly, Quick Disconnect
4 Inch Female to 1½ Inch Male
Figure E-25**



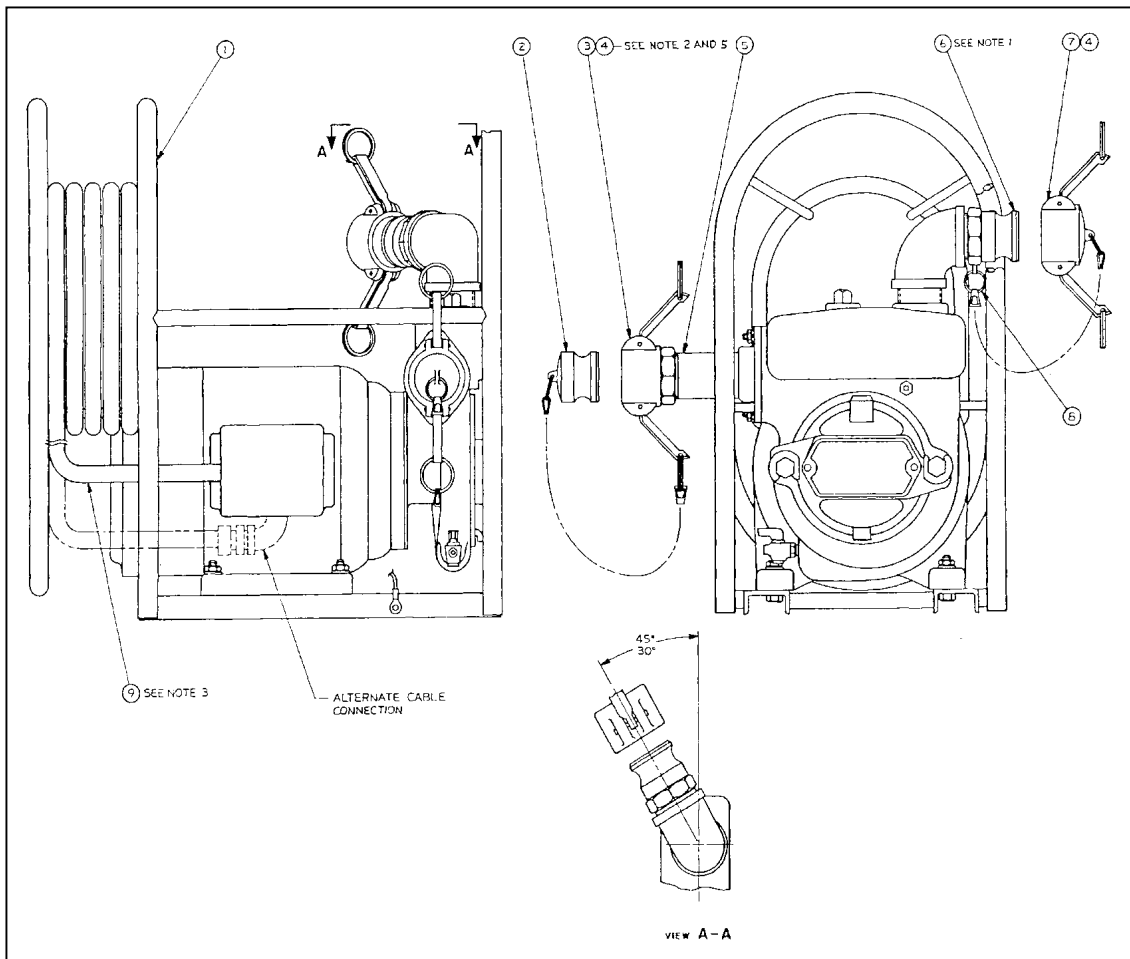
(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
25		4730-01-445-5188	13229E7190	Adapter Assembly Quick Disconnect 4"F to 1 1/2"M	1	EA
25	1	4730-00-640-6188	MS27029-17	Plug, Quick Disconnect 4"	1	EA
25	2	4730-01-020-4763	MS27024-17	Plug, Quick Disconnect 4"	1	EA
25	3	5330-00-899-4509	MS27030-9	Gasket	1	EA
25	4	4730-01-440-0080	13229E7191-24	Fitting, Pipe	1	EA
25	5	8030-00-889-3534	H01434M	Tape, Antiseizing	V	AR
25	6	5325-00-926-5411	A-A-58092	Ring, Retaining	6	EA
25	7	4730-00-360-0589	MS27022-9	Coupling Half Quick Disconnect 1 1/2"M w/M NPT	1	EA
25	8	4730-00-869-5246	MS27028-9	Cap, Quick Disconnect 1 1/2"	1	EA
25	9	5330-00-360-0595	MS27030-5	Gasket	1	EA

SECTION 2 – REPAIR PARTS LISTS

Pump Assembly, Centrifugal

65 GPM

Figure E-26



(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
26		4320-01-440-4421	13229E7159	Pump Assembly, Centrifugal	2	EA

SECTION 2 – REPAIR PARTS LISTS

Heater, Water, 9,000 Watts

Figure E-27



(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
27		4520-01-493-7423	111739	Heater, Water, 9,000 Watts	12	EA

SECTION 2 – REPAIR PARTS LISTS

Hypochlorination Unit

Figure E-28

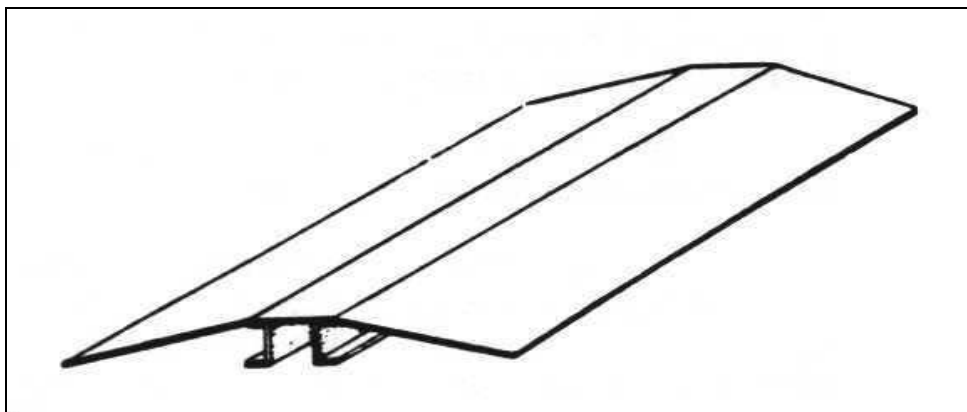
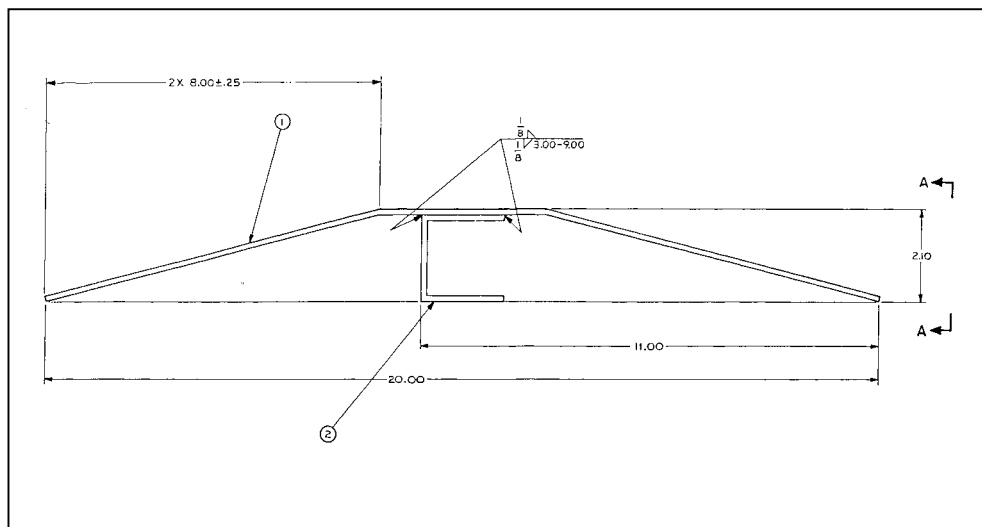


(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
28		4610-01-435-4884	WAL-1031-96	Hypochlorination Unit	1	EA
28		6810-01-358-4336	13229E0923	Sodium, Hypochlorite Technical	6	BG

SECTION 2 – REPAIR PARTS LISTS

Channel, Hose Protector, Surface

Figure E-29

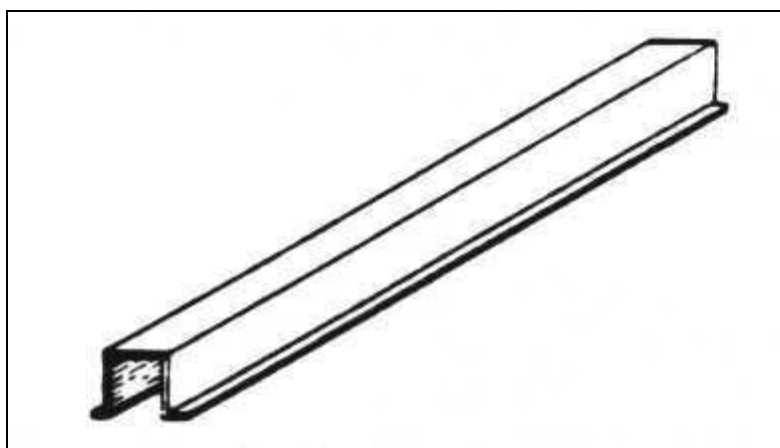
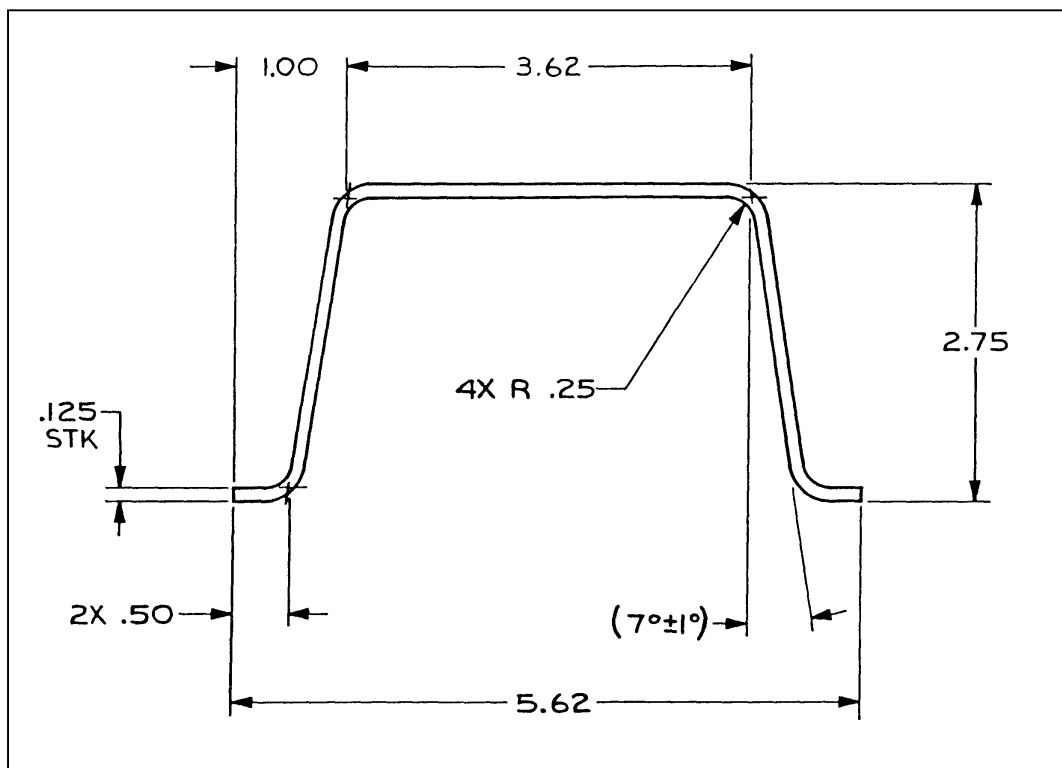


(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
29		4720-01-440-4925	13229E7176	Channel, Hose Protector	10	AY

SECTION 2 – REPAIR PARTS LISTS

Channel. Hose Protector, Subsurface

Figure E-30



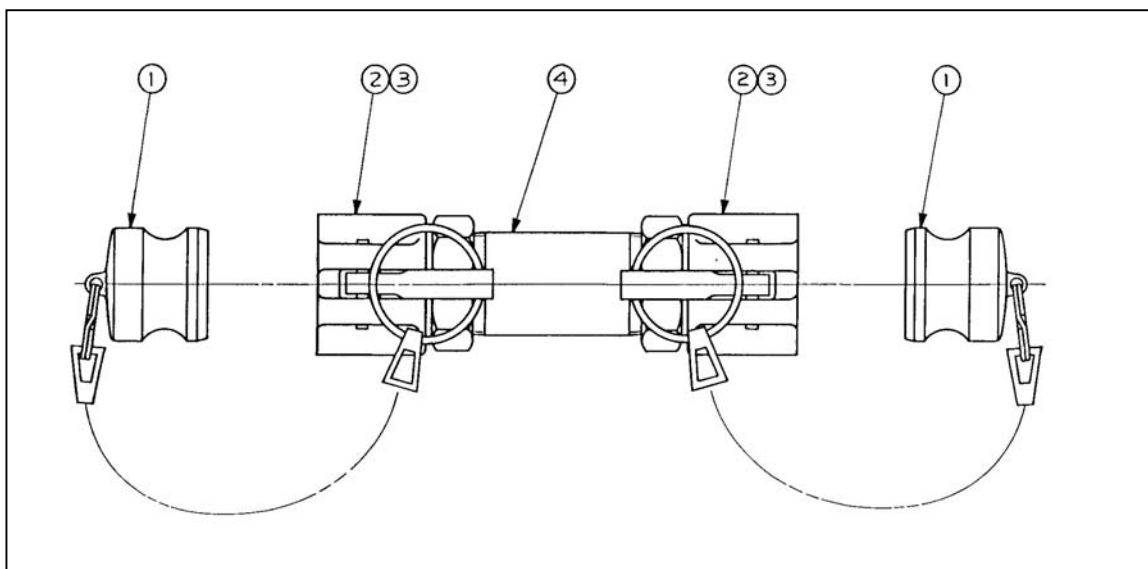
(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
30		4720-01-440-4928	13229E7175	Channel, Hose Protector	5	EA

SECTION 2 – REPAIR PARTS LISTS

Coupling Assembly, Quick Disconnect

1-Inch Female x 1-Inch Female

Figure E-31



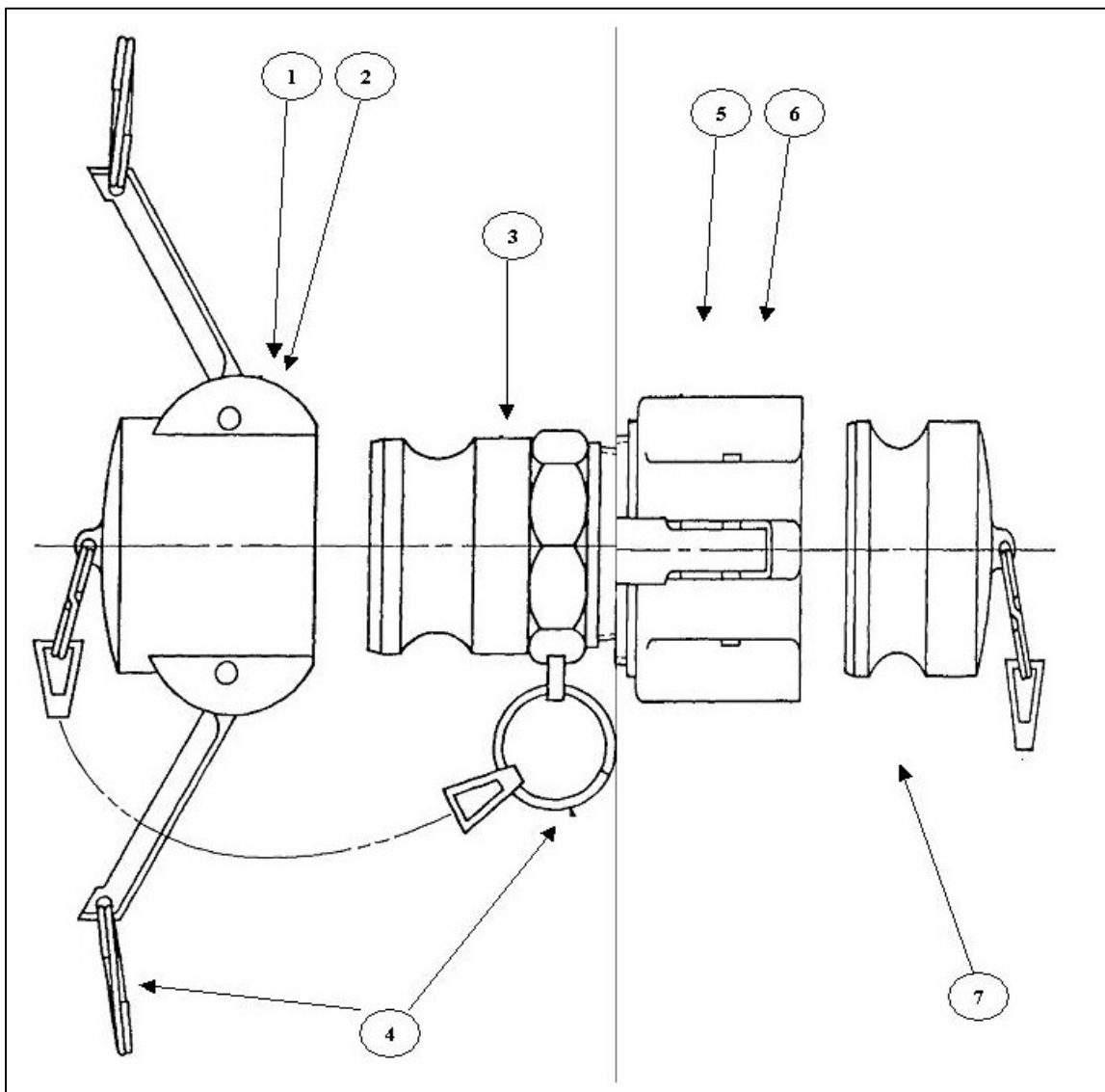
(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
31		4730-01-440-8569	13229E7173	Coupling Assembly, Quick Disconnect	1	EA
31	1	4730-00-360-0715	MS27029-5	Plug, Quick Disconnect	2	EA
31	2	4730-00-042-5265	MS27024-5	Coupling Half, Quick Disconnect, 1" with female NPT	2	EA
31	3	5330-00-088-9167	MS27030-4	Gasket	2	EA
31	4			Pipe, 1" Threaded (Male)	1	EA

Water Distribution and Wastewater Management System (WDWWMS)

(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
32		4730-01-499-8752	3629	Reducer, Quick Disconnect, 1-Inch F to 1½ Inch Male	1	EA
32	1	4730-00-869-5246	MS27028-9	Cap, Quick Disconnect, 1½ Inch	1	EA
32	2	5330-00-360-0595	MS27030-5	Gasket, 1½ Inch	1	EA
32	3	4730-00-360-0589	MS27022-9	Coupling Half, Quick Disconnect, 1½ Inch Male With Male NPT	1	EA
32	4	5325-00-926-5411	H01434M	Ring, Retaining	5	EA
32	5	4730-00-042-5265	MS27024-5	Coupling Half, Quick Disconnect, 1-Inch Female with Female NPT	1	EA
32	6	5330-00-088-9167	MS27030-4	Gasket, 1-Inch	1	EA
32	7	4730-00-360-0715	MS27029-5	Plug, Quick Disconnect, 1-Inch	1	EA
32		8030-00-889-3534	A-A-58092	Tape, Antisiezing	V	AR

SECTION 2 – REPAIR PARTS LISTS

**Reducer, Quick Disconnect
1-Inch Male to 1 ½ Inch Female
Figure E-33**



Water Distribution and Wastewater Management System (WDWWMS)

(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
33		4730-01-499-8687	3630	Reducer, Quick Disconnect, 1½ Inch F to 1-Inch Male	1	EA
33	1	4730-00-360-0791	MS27028-5	Cap, Quick Disconnect, 1-Inch	1	EA
33	2	5330-00-088-9167	MS27030-4	Gasket, 1-Inch	1	EA
33	3	4730-00-084-7435	MS27022-5	Coupling Half, Quick Disconnect, 1-Inch Male With Male NPT	1	EA
33	4	5325-00-926-5411	H01434M	Ring, Retaining	5	EA
33	5	4730-00-980-9411	MS27024-9	Coupling Half, Quick Disconnect, 1½ Inch Female with Female NPT	1	EA
33	6	5330-00-360-0595	MS27030-5	Gasket, 1½ Inch	1	EA
33	7	4730-00-823-5316	MS27029-9	Plug, Quick Disconnect, 1½ Inch	1	EA
33		8030-00-889-3534	A-A-58092	Tape, Antisiezing	V	AR

APPENDIX F
ORGANIZATIONAL MAINTENANCE
REPAIR PARTS AND COMPONENTS
WASTEWATER MANAGEMENT SET, HOSPITAL, DEPMEDS

SECTION 1. INTRODUCTION

F-1. Scope. This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for the performance of organizational maintenance of the Wastewater Management Set, Hospital, DEPMEDS.

F-2. General. In addition to Section 1, Introduction, this Repair Parts and Special Tools List is divided into the following sections:

- a. Section 2 – Repair Parts List. A list of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of parts, with the components of each part listed in ascending figure and item number sequence. Bulk materials are listed by item name in FIG BULK at the end of the section.
- b. Section 3 – Special Tools List. Not applicable.
- c. Section 4 – Cross reference Indexes. Not applicable.

F-3. Explanation of Columns (Section 2).

- a. FIG NO. (Column 1). This column lists the number of the figure where the item is identified/located.
- b. ITEM NO. (Column 2). Indicates the number used to identify items called out in the illustration.
- c. SMR Code. Not applicable.
- d. NSN (Column 3). The National Stock Number which is used to identify the item.
- e. PART NUMBER (Column 4). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity) which controls the design, specifications, standards, and inspection requirements to identify an item or range of items.
- f. DESCRIPTION (Column 5). This column contains the following information:

Water Distribution and Wastewater Management System (WDWWMS)

(1) The Federal Item name and, when required, a minimum description to identify the item.

(2) Spare/repair parts that make up an assembled item are listed immediately following the assembled item line entry.

(3) Part numbers for bulk materials are references in this column in the line item entry for the item to be manufactured/fabricated.

(4) The usable on code. Not applicable.

g. QTY (Column 6). The QTY (quantity per figure column) indicates the quantity of the item used in the illustration figure. A “V” appearing in this column in lieu of a quantity indicates that the quantity is variable and quantity may vary from application to application.

h. UI Column 7). The UI (Unit of Issue) indicates the unit of issue of the item used in the illustrated figure. A “AR” appearing in this column in lieu of a unit of issue indicates that the unit is as required and may vary from application to application.

F-4. Explanation of Columns (Section 4). Not applicable.

F-5. Special Information. Not applicable.

F-6. How to Locate Repair Parts.

a. When NSN or Part Number is Not Known.

(1) First. Using the table of contents, determine the assembly group or subassembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and listings are divided into the same groups.

(2) Second. Find the figure covering the assembly group of subassembly group to which the item belongs.

(3) Third. Identify the item on the figure and use the corresponding table to find the NSN or Part Number.

b. When NSN or Part Number is Known. Not applicable.

F-7. Abbreviations. Not applicable.

SECTION 2 – REPAIR PARTS LISTS

Cage, Wire, Folding

Figure F-1

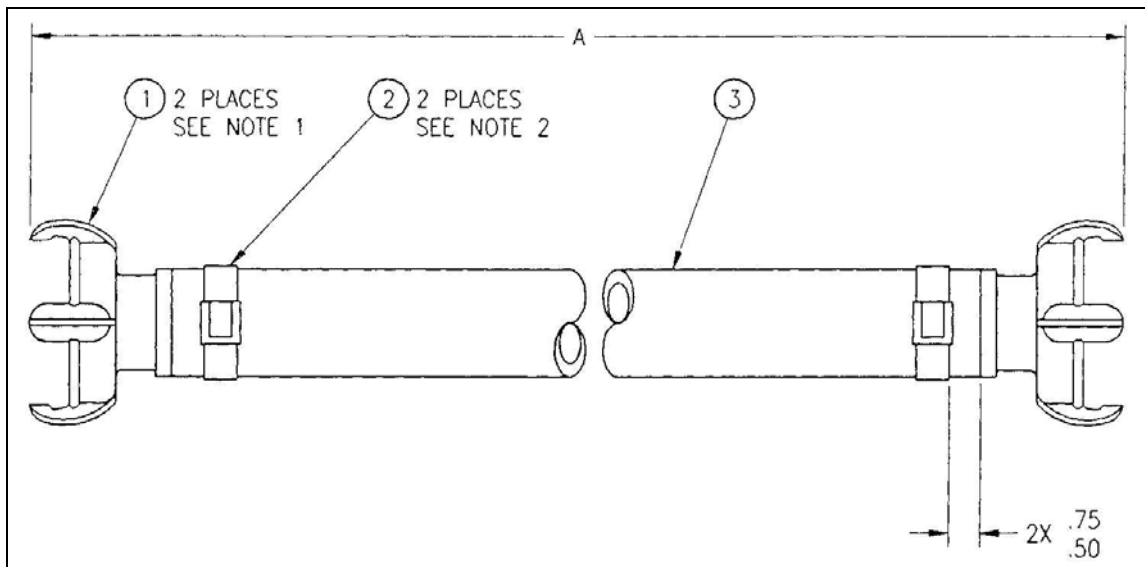


(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
1	1	TBD		Cage, Wire Folding	1	EA

SECTION 2 – REPAIR PARTS LISTS

Hose Assembly, Rubber

Figure F-2

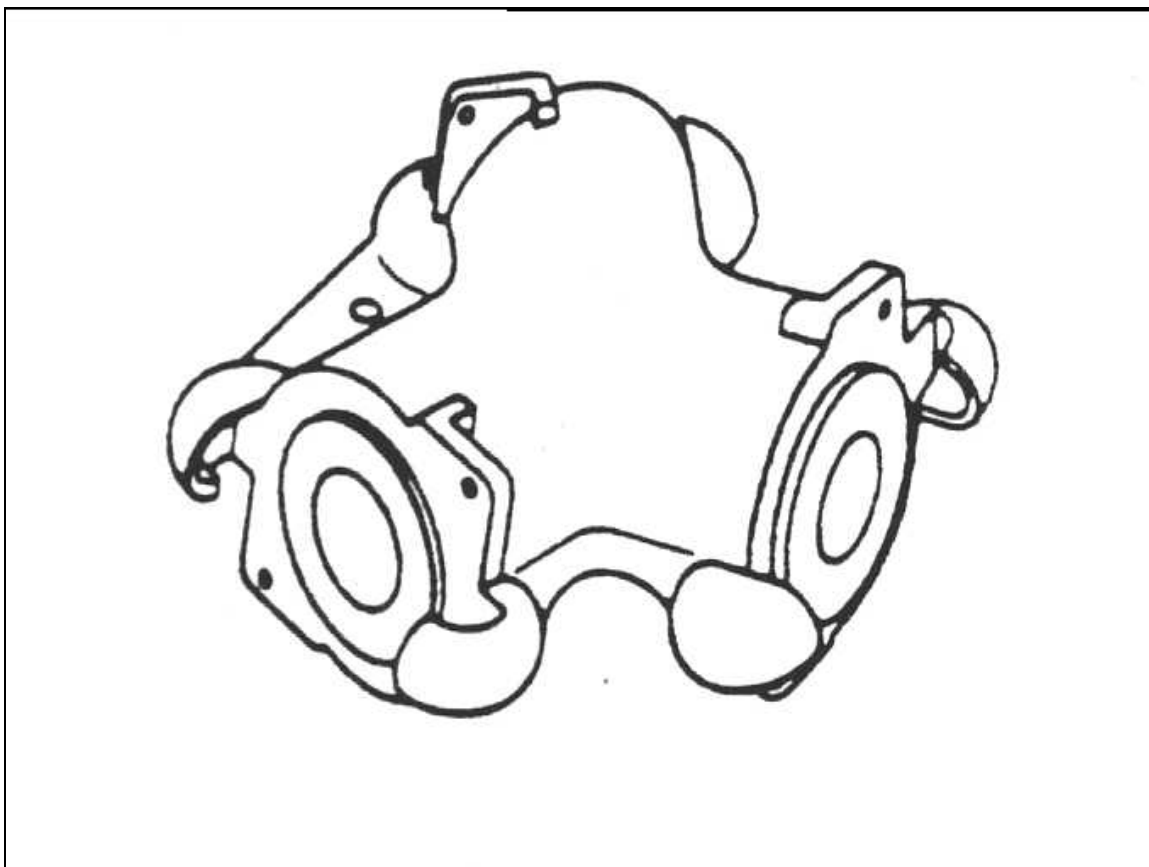


(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
2		4720-01-434-9638	13230E5746-4	Hose Assembly Rubber	1	EA
2	1	4730-00-948-1722	MS27025-9	Coupling Quick Disconnect	2	EA
2	2	4720-00-876-8903	J-409	Clamp, Hose	2	EA
2	3			Hose, Rubber	1	EA

SECTION 2 – REPAIR PARTS LISTS

Wye, Quick Disconnect

Figure F-3

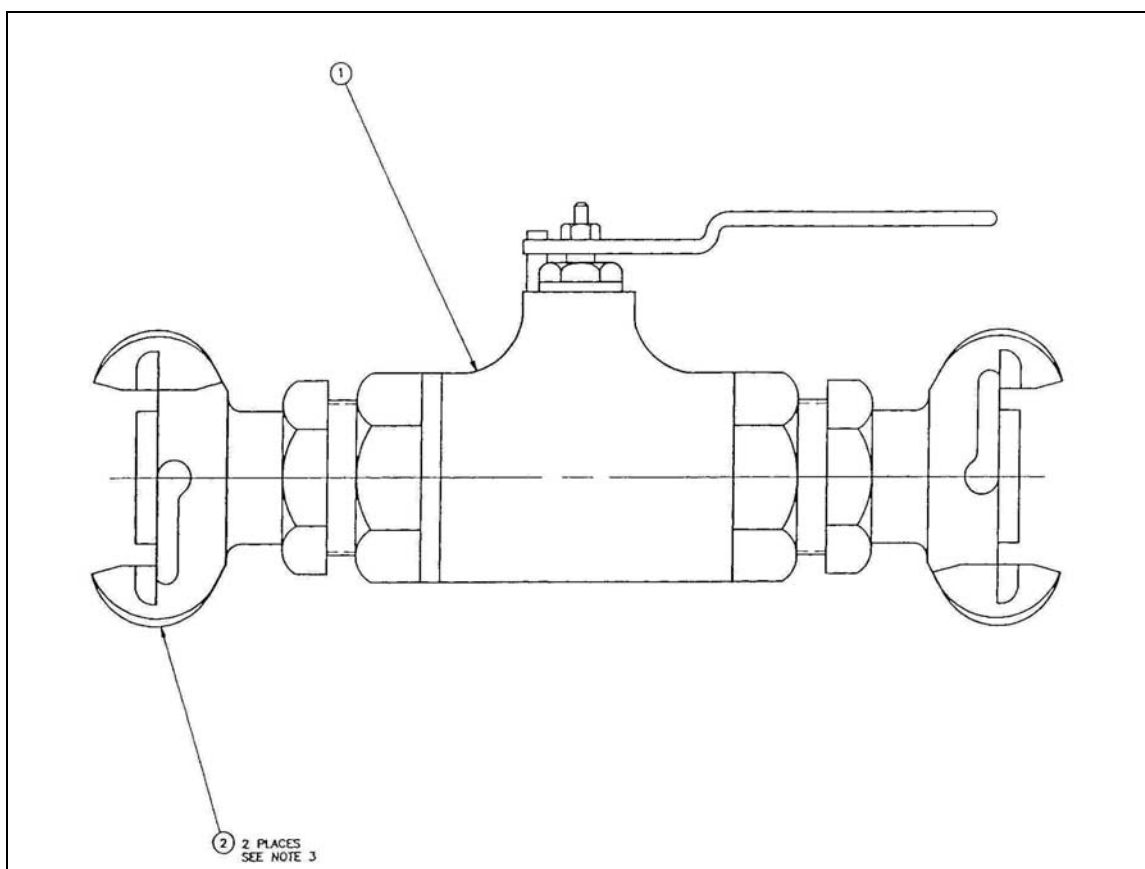


(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
3		4730-00-496-5952	AM-10	Wye, Quick Disconnect	1	EA

SECTION 2 – REPAIR PARTS LISTS

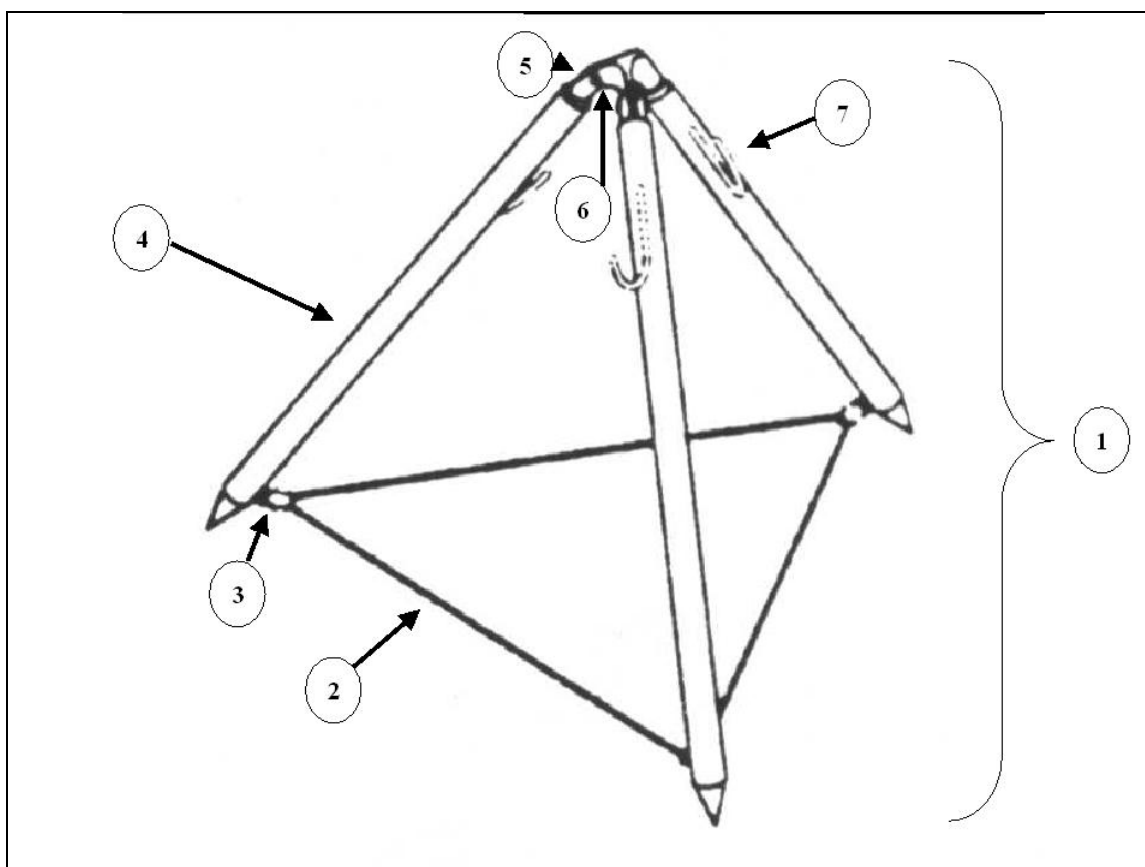
Valve, Ball

Figure F-4



(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
4		4820-01-440-5916	13225E7225	Valve Assembly, Ball	1	EA
4	1		WW-V-35	Valve, Ball	1	EA
4	2	4730-00-289-1261	WW-C-633	Coupling Half Quick Disconnect	2	EA
4		8030-00-889-3534	H01434M	Tape, Antiseizing	V	AR

SECTION 2 – REPAIR PARTS LISTS
Stand Assembly, Distribution Nozzle
Figure F-5

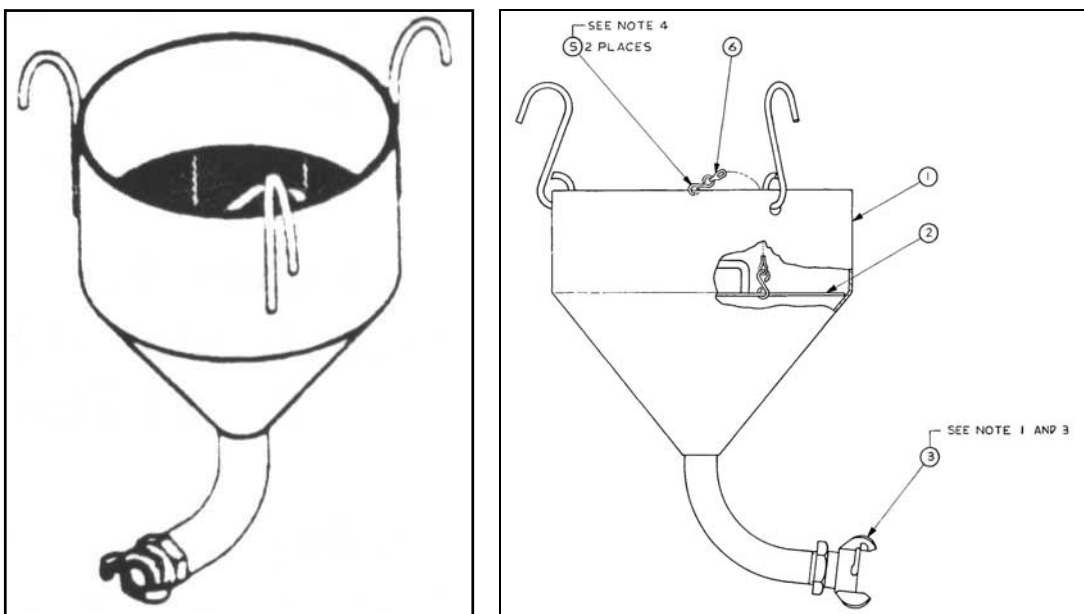


(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
5	1	4930-01-120-7426	13225E9140	Stand Assembly, Distribution Nozzle	1	EA
5	2		RR-C-271	Chain, Weldless	V	AR
5	3	4030-01-198-4257	MS87006-22	Hook, Chain, S	3	EA
5	4	6530-01-472-7843	13225E9145	Leg, Pivot	1	EA
5	5	5315-00-839-5820	MS24665-134	Pin, Cotter, Split	2	EA
5	6	5315-00-812-1236	MS20392-3C35	Pin, Straight, Headed	2	EA
5	7	6530-01-472-7847	13225E9146	Leg, Clevis	2	EA

SECTION 2 – REPAIR PARTS LISTS

Funnel Assembly

Figure F-6



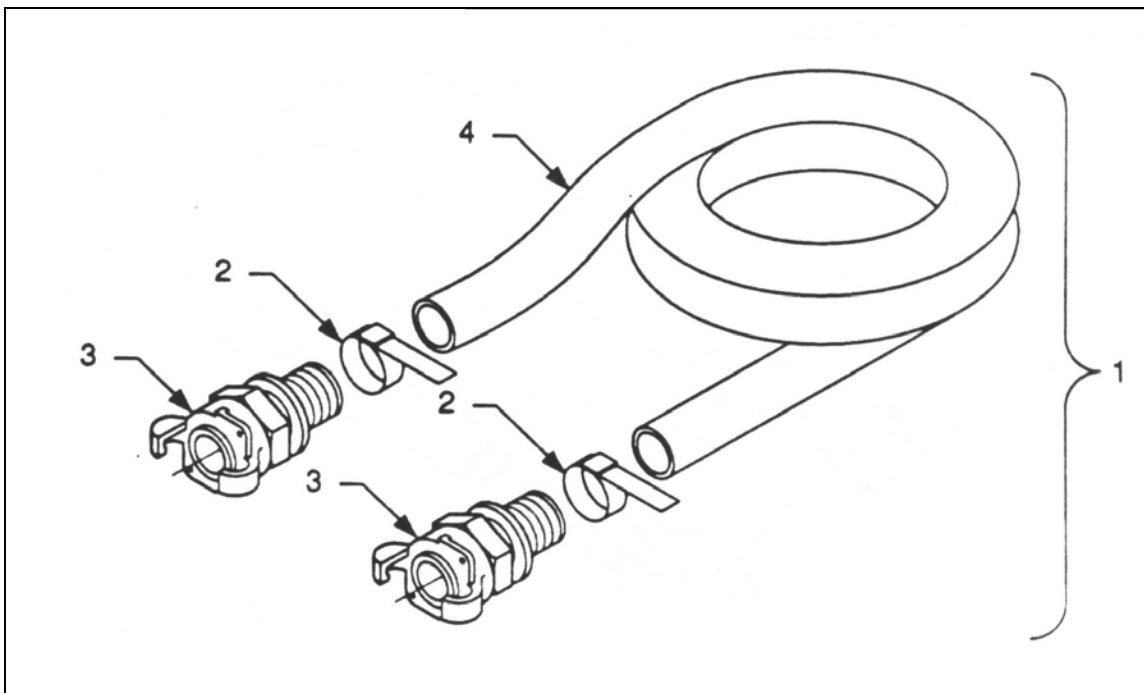
(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
6		6545-01-434-9587	13229E7229	Funnel Assembly	1	EA
6	1		13229E7227	Funnel	1	EA
6	2		13229E7228	Screen Funnell	1	EA
6	3		WW-C-633	Coupling Half Quick Disconnect	1	EA
6	4	8030-00-889-3534	H01434M	Tape, Antiseizing	V	AR
6	5	4030-00-780-9350	MS87006-13	Hook, Chain S	3	EA
6	6		RR-C-271	Chain	2	EA

SECTION 2 – REPAIR PARTS LISTS

Hose Assembly, Rubber

1 Inch x 10 Feet

Figure F-7



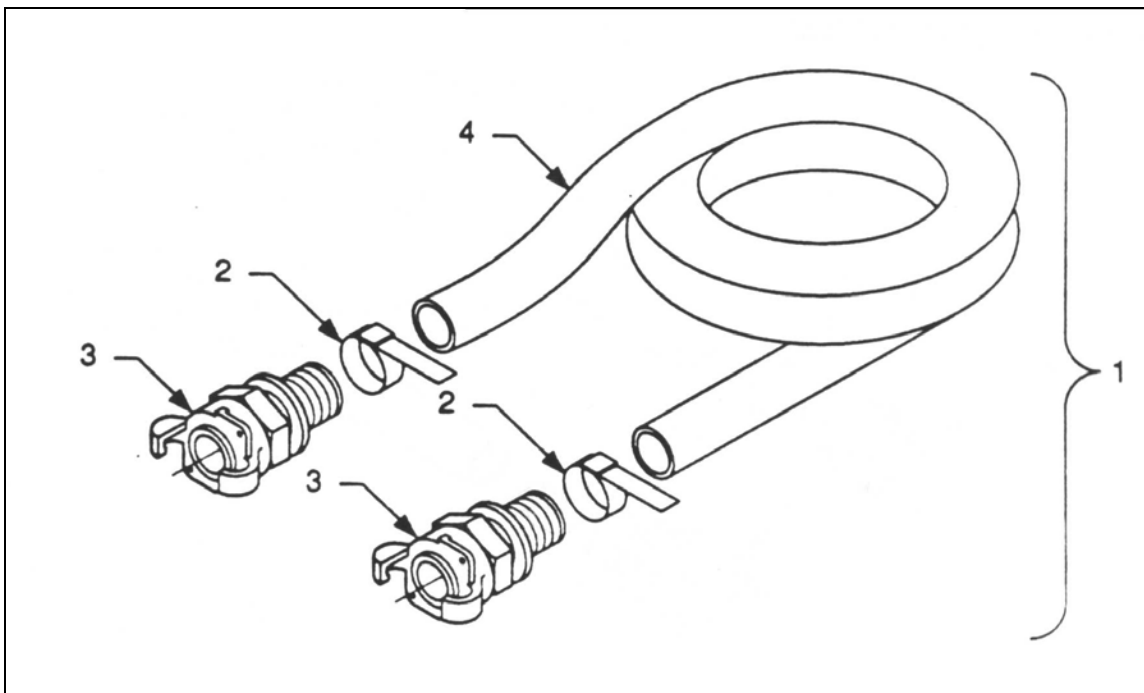
(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
7	1	4720-01-434-9594	13229E7223-2	Hose Assembly Rubber	1	EA
7	2		WWC663-05-M	Coupling Half Quick Disconnect	2	EA
7	3	4720-00-876-8903	J-409	Clamp, Hose	2	EA
7	4		ZZH601-3-1-16	Hose, Nonmetallic	10	FT

SECTION 2 – REPAIR PARTS LISTS

Hose Assembly, Rubber

1 Inch x 20 Feet

Figure F-8



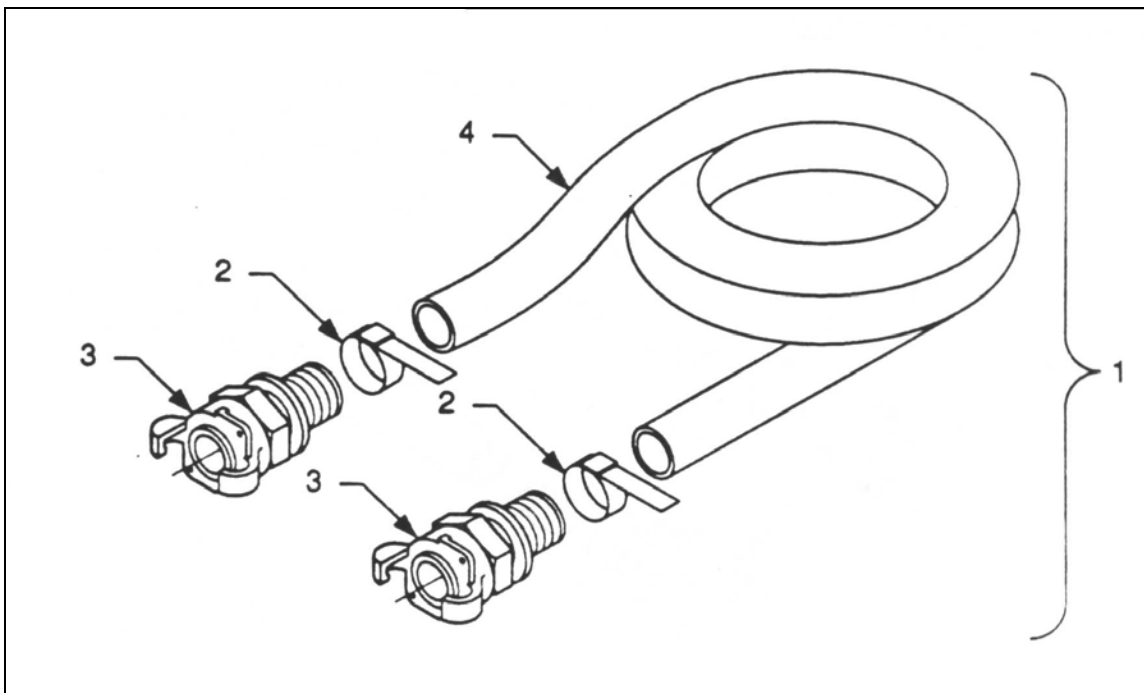
(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
8	1	6545-01-434-9605	13229E7223-3	Hose Assembly Rubber	1	EA
8	2		WWC663-05-M	Coupling Half Quick Disconnect	2	EA
8	3	4720-00-876-8903	J-409	Clamp, Hose	2	EA
8	4		ZZH601-3-1-16	Hose, Nonmetallic	20	FT

SECTION 2 – REPAIR PARTS LISTS

Hose Assembly, Rubber

1 Inch x 5 Feet

Figure F-9



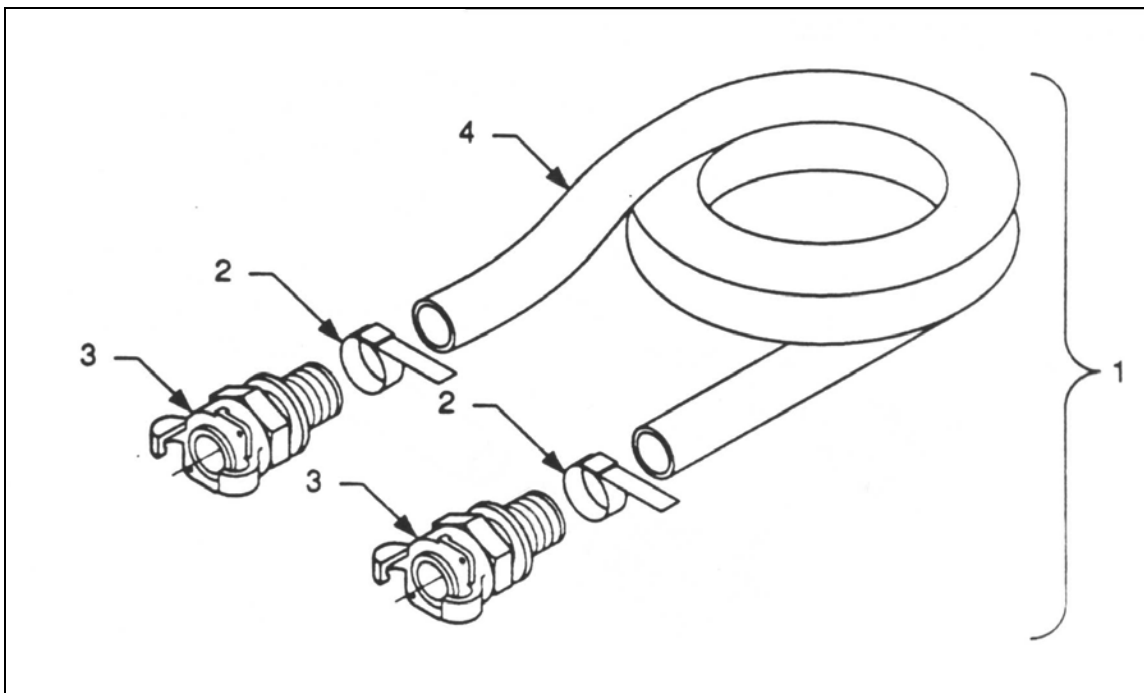
(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
9	1	4720-01-434-9646	13229E7223-1	Hose Assembly Rubber	1	EA
9	2		WWC663-05-M	Coupling Half Quick Disconnect	2	EA
9	3	4720-00-876-8903	J-409	Clamp, Hose	2	EA
9	4		ZZH601-3-1-16	Hose, Nonmetallic	5	FT

SECTION 2 – REPAIR PARTS LISTS

Hose Assembly, Rubber

1 Inch x 50 Feet

Figure F-10

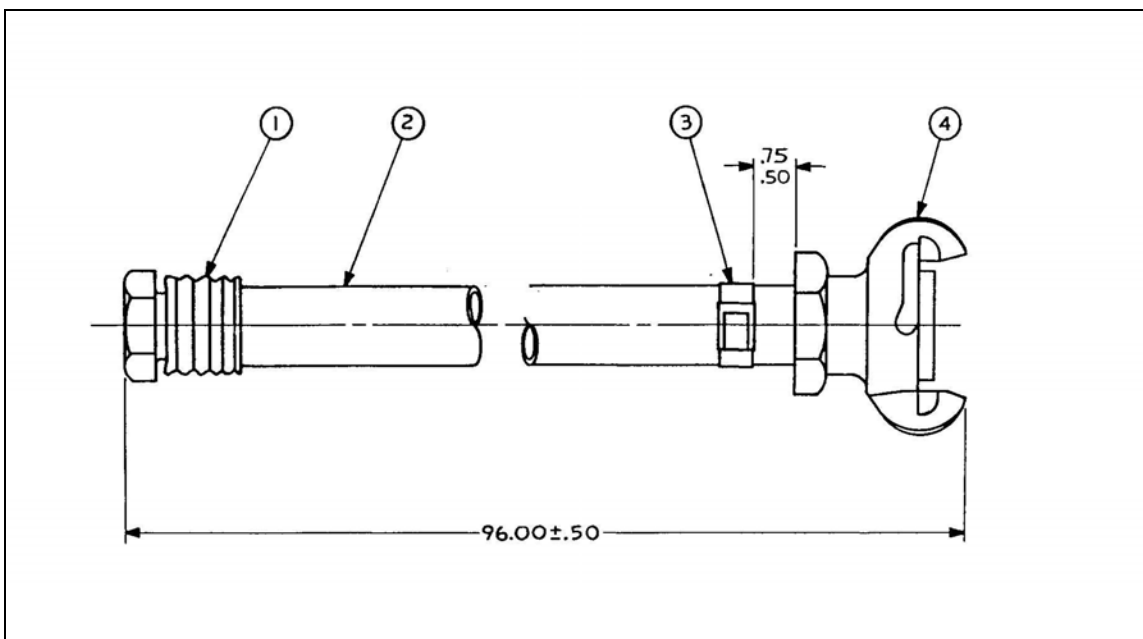


(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
10	1	4720-01-434-9649	13229E7223-4	Hose Assembly Rubber	1	EA
10	2		WWC663-05-M	Coupling Half Quick Disconnect	2	EA
10	3	4720-00-876-8903	J-409	Clamp, Hose	2	EA
10	4		ZZH601-3-1-16	Hose, Nonmetallic	50	FT

SECTION 2 – REPAIR PARTS LISTS

Hose Assembly, Rubber

Figure F-11

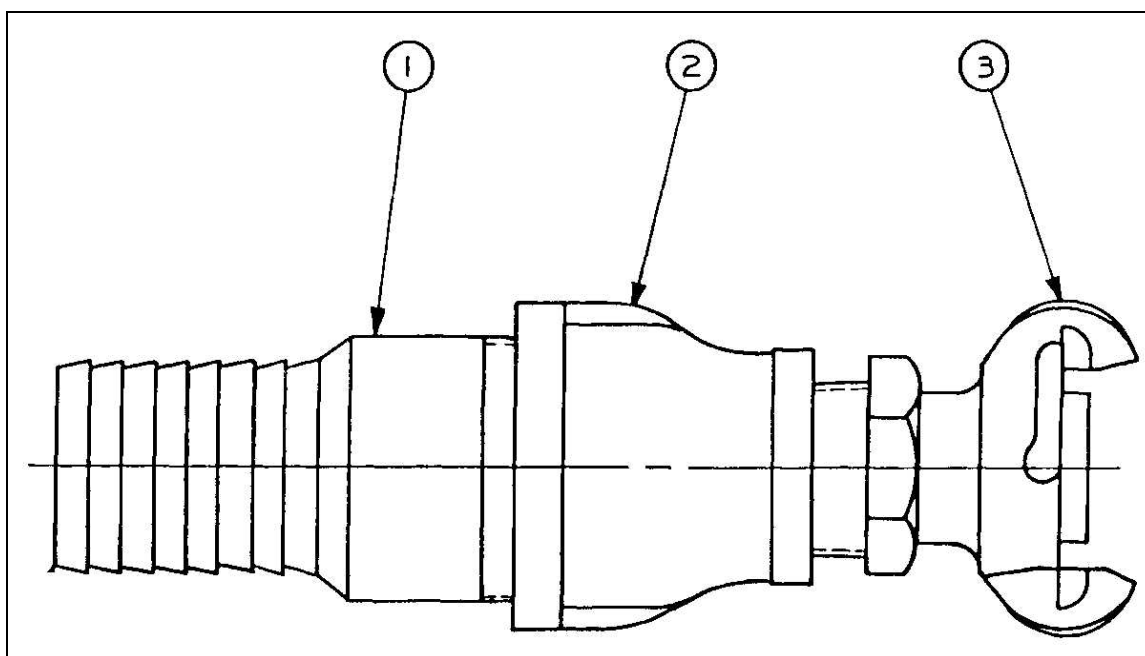


(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
11	1	4720-01-434-9627	13229E7226	Hose Assembly Rubber	1	EA
11	2	4730-01-280-8542	NH99670410524	Clamp, Hose	2	EA
11	3		WWC624-2G-6-06	Coupling Assembly Hose	1	EA
11	4		WWC633-04-M	Coupling Half Quick Disconnect	1	EA
11	2		ZZH601-3-1-12-8	Hose, Nonmetallic	10	FT

SECTION 2 – REPAIR PARTS LISTS

Hamilton Sink Adapter

Figure F-12



(1) FIG NO	(2) ITEM NO	(3) NSN	(4) PART NO.	(5) DESCRIPTION	(6) QTY	(7) UI
12		6545-01-434-9630	13229E7224	Adapter, Sink	1	EA
12	1	4730-01-371-2595	BST-20	Adapter, Straight Pipe to Hose	1	EA
12	2	4730-00-057-2971	ANSI B16.3	Coupling, Pipe	1	EA
12	3		WWC633-15-M	Coupling Half Universal 1"	1	EA
12		8030-00-889-3534	A-A-58092	Tape, Antiseizing	V	AR

APPENDIX G
ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT
MAINTENANCE, REPAIR PARTS AND SPECIAL TOOLS LIST

PUMP UNIT, CENTRIFUGAL, 65 GPM

INTRODUCTION

G-1. Scope.

This section lists the repair parts and special tools for operation and performance of organizational, direct support, and general support maintenance of the E. C. Schleyer Pump Co. Model 4M-SE2000 electric motor driven pump.

G-2. General

This Repair Parts and Special Tools List is divided into the following sections:

- a. *Section II, Repair Parts List.* A list of repair parts authorized for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending numerical sequence, with the parts in each group listed in figure and item number sequence. Bulk materials are listed in NSN sequence.
- b. *Section III, Special Tools List.* (Not Applicable).
- c. *Section IV, National Stock Number and Part Number Index.* A list, in ascending numerical sequence, of all National Stock Numbers (NSN) appearing in the listings, followed by a list, in alphanumeric sequence, of all part numbers appearing in the listings. NSNs and part numbers (PN) are cross-referenced to each illustration figure and item number appearance. This index is followed by a cross-reference list of reference designations to figure and item number when applicable.

G-3. Explanation of Columns.

The following provides an explanation of columns in the tabular listings:

- a. *Illustration.* This column is divided as follows:
 - (1) *Figure Number.* Indicates the figure number of the illustration in which the item is shown.
 - (2) *Item Number.* The number used to identify each item called out in the illustration.

Water Distribution and Wastewater Management System (WDWWMS)

b. *Source, Maintainability and Recovery Codes (SMR).*

(1) *Source Code.* Source codes are assigned to support items to indicate the manner of acquiring support items for maintenance, repair, or overhaul of end items. Source codes are entered in the first and second positions of the Uniform SMR Code format as follows:

<i>Code</i>	<i>Definition</i>
PA	Item procured and stocked for anticipated or known usage.
PB	Item procured and stocked for insurance purpose because essentiality dictates that a minimum quantity be available in the supply systems.
PC	Item procured and stocked and which otherwise would be coded PA except that it is deteriorative in nature.
PD	Support item, excluding support equipment, procured for initial issue or outfitting and stocked only for subsequent or additional issues or outfittings. Not subject to automatic replenishment.
PE	Support equipment procured and stocked for initial issue or outfitting to specific maintenance repair activities.
PF	Support equipment which will not be stocked but which will be centrally procured on demand.
PG	Item procured and stocked to provide for sustained support for the life of the equipment. It is applied to an item peculiar to the equipment which, because of probable discontinuance or shutdown of production facilities, would prove uneconomical to reproduce at a later time.
KD	An item of a depot overhaul/repair kit and not purchased separately. Depot kit defined as a kit that provides items required at the time of overhaul or repair.
KF	An item of a maintenance kit and not purchased separately. Maintenance kit defined as a kit that provided an item that can be replaced at organizational or intermediate levels of maintenance.
KB	Item included in both a depot overhaul/repair kit and a maintenance kit.
MO	Item to be manufactured or fabricated at organizational level.
MF	Item to be manufactured or fabricated at direct support level.
MH	Item to be manufactured or fabricated at general support level.

Water Distribution and Wastewater Management System (WDWWMS)

MD Item to be manufactured or fabricated at depot maintenance level.

Code Definition

AO Item to be assembled at organizational level.

AF Item to be assembled at direct support maintenance level.

AH Item to be assembled at general support maintenance level.

AD Item to be assembled at depot maintenance level.

XA Item is not procured or stocked because the requirements for the item will result in the replacement of the next higher assembly.

XB Item is not procured or stocked. If not available through salvage, requisition.

XD A support item that is not stocked. When required item will be procured through normal supply channels.

NOTE

Cannibalization or salvage may be used as a source of supply for any items coded above except for those coded XA, XD, and aircraft support items as restricted by AR 700-42.

(2) Maintenance Code.

Maintenance codes are assigned to indicate the levels of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the Uniform SMR Code format as follows:

(a) The maintenance code

entered in the third position will indicate the lowest maintenance level authorized to remove, replace, and use the support item. The maintenance code entered in the third position will indicate one of the following levels of maintenance:

Code Application/Explanation

C Crew or operator maintenance performed within organizational maintenance.

O Support item is removed, replaced, used at the organizational level.

I Support item is removed, replaced, used by the direct support element of integrated direct support maintenance.

F Support item s removed, replaced, used at the direct support level.

Water Distribution and Wastewater Management System (WDWWMS)

<i>Code</i>	<i>Application/Explanation</i>
-------------	--------------------------------

H	Support item s removed, replaced, used at the general support level.
---	--

D	Support item s removed, replaced, used at the depot, mobile depot, specialized repair activity only.
---	--

NOTE

Codes "I" and "F" will be considered the same by direct support units.

(b) The maintenance code entered in the fourth position indicates whether the item is to be repaired and identified the lowest maintenance level with the capability to perform repair (i.e., all authorized maintenance functions). This position will contain one of the following maintenance codes:

<i>Code</i>	<i>Application/Explanation</i>
-------------	--------------------------------

O	The lowest maintenance level capable of complete repair of support item is the organizational level.
---	--

F	The lowest maintenance level capable of complete repair of support item is the direct support level.
---	--

H	The lowest maintenance level capable of complete repair of support item is the general support level.
---	---

D	The lowest maintenance level capable of complete repair of support item is the depot level, mobile depot or specialized repair activity.
---	--

Z	Non-repairable. No repair is authorized.
---	--

B	No repair is authorized. The item may be reconditioned by adjusting, lubricating, etc., at the user level. No parts or special tools are procured for maintenance of this item.
---	---

(3) Recoverability Code.

Recoverability codes are assigned to support items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the Uniform SMR Code format as follows:

Recoverability

Codes

Definition

Z	Non-Repairable item. When unserviceable, condemn and dispose at the level indicated in position 3.
O	Repairable item. When uneconomically repairable, condemn and dispose at organizational level.
F	Repairable item. When uneconomically repairable, condemn and dispose at the direct support level.
H	Repairable item. When uneconomically repairable, condemn and dispose at the general support level.
D	Repairable item. When beyond lower level repair capability, return to depot. Condemnation and disposal not authorized below depot level.
L	Repairable item. When beyond lower level repair capability, return to depot. Condemnation and disposal not authorized below depot/special repair activity level.
A	Item requires special handling or condemnation procedures because of specific reasons (i.e., precious metal content, high dollar value, critical material or hazardous material). Refer to appropriate manuals/directives for specific instructions.

c. National Stock Number.

Indicates the National Stock Number assigned to the item and will be used for requisitioning purposes.

d. Part Number. Indicates the primary part number used by the manufacturer which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements, to identify an item or range of items.

NOTE

When a stock numbered item is requisitioned, the repair part received may have a different part number than the part being replaced.

e. *Federal Supply Code for Manufacturer (FSCM)*. The FSCM is a 5-digit numeric code listed in SB 708-42 which is used to identify the manufacturer, distributor, or Government agency, etc.

f. *Description*. Indicates the Federal item name and, if required, a minimum description to identify the item.

g. *Unit of Measure (U/M)*. Indicates the standard of the basic quantity of the listed item as used in performing the actual maintenance function. This measurement is expressed by a two-character alphabetical abbreviation (e.g., ea. in. pr. Etc.). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

h. *Quantity Incorporated in Unit*. Indicates the quantity of the item used in the breakdown shown on the illustration figure which is prepared for a functional group, subfunctional group, or an assembly. A “V” appearing in this column in lieu of a quantity indicates that no specific quantity is applicable, (e.g., shims, spacers, etc.).

G-4. How to Locate Repair Parts.

a. *When National Stock Number or Part Number is Unknown.*

(1) *First*. Using the table of contents, determine the functional group within which the repair part belong. This necessary since illustrations are prepared for functional groups and listing are divided into the same groups.

(2) *Second*. Find the illustration covering the functional group to which the repair part belongs.

(3) *Third*. Identify the repair part on the illustration figure and item number of the repair part.

(4) *Fourth*. Using the Repair Parts Listing, find the figure and item number noted on the illustration.

b. *When National Stock Number or Part Number is Known.*

(1) *First*. Using the Index of National Stock Numbers and Part Numbers, find the pertinent National Stock Number or part number. This index is in ascending NSN sequence followed by a list of part numbers in ascending alphanumeric sequence, cross-references to the illustration figure number and item number.

(2) *Second.* After finding the figure and item number, locate the figure and item number in the repair parts list.

G-5. Abbreviations.

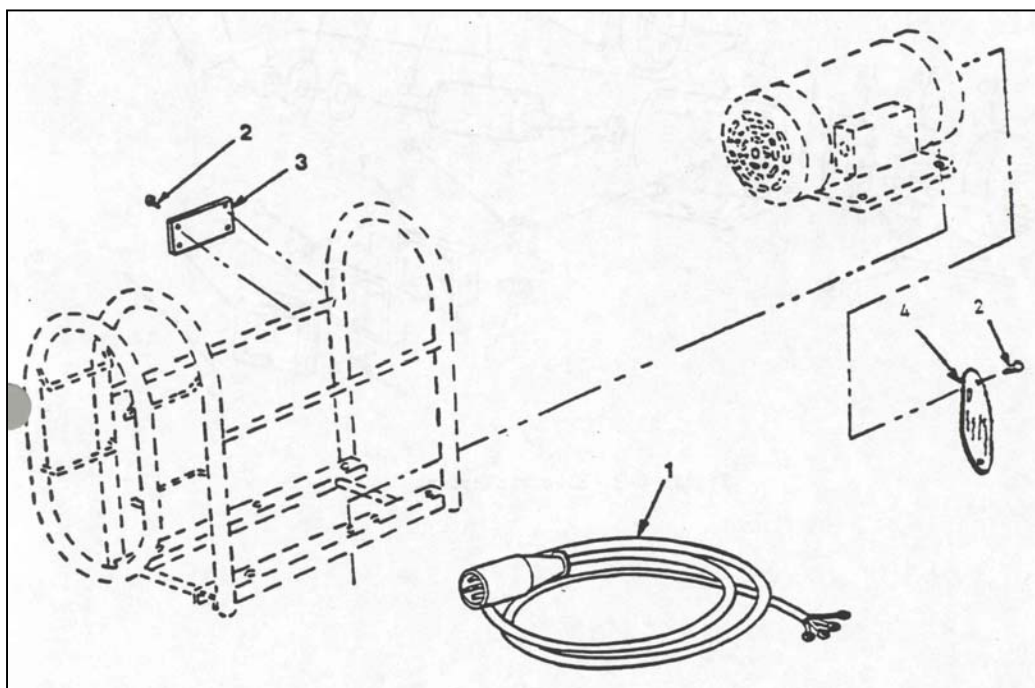
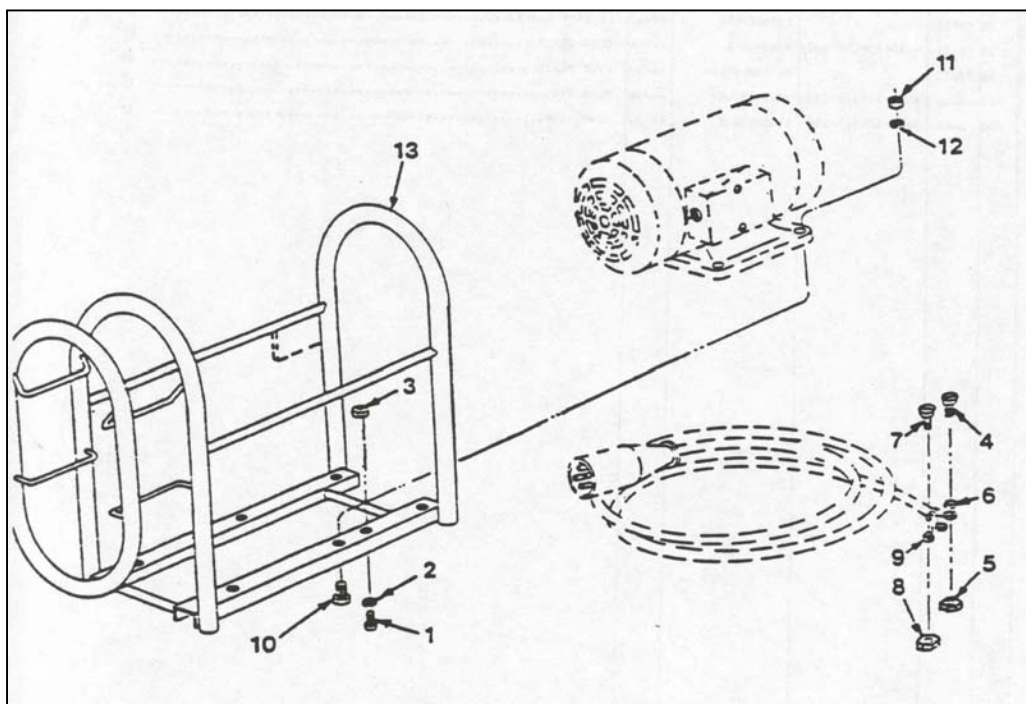
<i>Abbreviations</i>	<i>Explanation</i>
mtg	mounting

Water Distribution and Wastewater Management System (WDWWMS)

(1)		(2)	(3)	(4)	(5)	(6)
Illustration						
(a)	(b)					
Figure	Item	SMR				
No.	No.	Code	NSN	Part Number	FSCM	Nomenclature
						SECTION 01 REPAIR PARTS LIST
						Group 31 - FRAME ASSEMBLY
G.1	1	PAOZZ	5305-00-068-0502	MS90725-64	96906	Screw, Cap, Hexagon Head
G.1	2	PAOZZ	5310-00-582-5965	MS35338-44	96906	Washer, Lock
G.1	3	PAOZZ	5310-00-761-6882	MS51967-2	96906	Nut, Plain, Hexagon
G.1	4	PAOZZ	5305-00-993-2461	MS35207-281	96906	Screw, Machine
G.1	5	PAOZZ	5310-00-903-8282	MS20364-428	96906	Nut, Self Locking, Hexagon
G.1	6	PAOZZ	5940-00-114-1317	MS20659-109	96906	Terminal, Lug
G.1	7	PAOZZ	5305-00-989-7435	MS35207-264	96906	Screw, Machine
G.1	8	PAOZZ	5310-00-902-6676	MS21083N3	96906	Nut, Self Locking, Hexagon
G.1	9	PAOZZ	5940-00-143-4794	MS25036-112	96906	Terminal, Lug
G.1	10	PAOZZ	5305-00-725-2317	MS90725-64	96906	Screw, Cap, Hexagon Head
G.1	11	PAOZZ	5310-00-732-0558	MS51967-8	96906	Nut, Plain, Hexagon
G.1	12	PAOZZ	5310-00-637-9541	MS35338-46	96906	Washer, Lock
G.1	13	PBOFE		13200E7218	97403	FR PUMP WELDMENT
						GROUP 02 ASSESSORY ITEMS
G.2	1	PAOZZ	6150-00-971-2116	1300E7222	97403	Cable Assembly, Power Electrical
G.2	2	PAOZZ	5305-00-253-5625	MS21318-46	96906	Screw, Drive
G.2	3	PAOZZ		6673407	78099	Plate, Data
G.2	4	PAOZZ		13219E2404	97403	Plate, Data
						GROUP 03 ELECTRIC MOTOR ASSEMBLY
G.3		PAOZZ	6150-00-971-2116	13200E7222	97403	Cable Assembly, Power Electric
G.3	1	PAOZZ	5305-00-855-0961	MS24629-35	96906	Screw, Tapping
G.3	2	PAOZZ		06-40	05472	Lid Box
G.3	3	PAOZZ		06-49	05472	Gasket Box Lid
G.3	4	PAOZZ	5305-00-206-2508	MS35215-53	96906	Screw, Machine
G.3	5	PAOZZ	5975-00-281-0049	7546075	19204	Box, Connector, Electrical
G.3	6	PAOZZ		A678760		Screw, Box
G.3	7	PAOZZ		36-2131		Box Connector
G.3	8	PAOZZ	5320-01-065-8851	36-48	05472	Gasket, Box
G.3	9	PAOZZ	5305-00-723-0385	02781	05748	Set Screw
G.3	10	PAOZZ		36-696	05472	Cover, Fan
G.3	11	PAOZZ	5305-00-723-9385	MS51963-65	96909	Set Screw
G.3	12	PAOZZ	4140-01-087-0359	32-134	05472	Fan, External
G.3	13	PAOZZ	5310-00-723-4458	MS35609-404	96906	Nut, Plain, Hexagon
G.3	14	PAOZZ		36-696	05472	Cover, Fan
G.3	15	PAPZZ		36-1120	05472	Endplate Pulley
G.3	16	PAPZZ		52WES	05472	Washer Retainer, Special
G.3	17	PAOZZ	5305-00-995-3441	MS35207-269	96906	Screw, Machine
G.3	18	PAOZZ	5310-00-045-3296	MS35338-43	96906	Washer, Lock
G.3	19	XBPZZ		36-694	05472	Endplate, Front

Water Distribution and Wastewater Management System (WDWWMS)

(1)		(2)	(3)	(4)	(5)	(6)
Illustration						
(a)	(b)					
Figure	Item	SMR				
No.	No.	Code	NSN	Part Number	FSCM	Nomenclature
						GROUP 03 ELECTRIC MOTOR ASSEMBLY
						(CONTINUED)
G.3	20	PAOZZ	5315-00-043-1787	MS35756-34	96906	Key, Woodruff
G.3	21	PAOZZ		6-31	05472	Sleeve, Shaft
G.3	22	PAOZZ	3110-00-109-1157	1169377	19204	Bearing, Ball, Annular
G.3	23	ABFZZ		6-417	05472	Retainer
G.3	24	ABFZZ		38-1008	05472	Fan, Internal
G.3	25	ABFZZ		36-3998	05472	Shaft
G.3	26	ABFZZ	6105-00-717-1361	36-271	05472	Motor, Electric
G.3	27	ABFZZ	6105-00-717-1283	36-2118	05472	Plate, Data
G.3		PAOZZ	6105-00-793-6752	62530	92940	Motor, Alternating Current
						GROUP 34 PUMP ASSEMBLY
G.4	1	PBFZZ	5306-00-686-5722	13200E7212	97403	Bolt, Shoulder
G.4	2	ABFZZ	5340-00-991-6492	13200E7203	97403	Cover, Access
G.4	3	PBFZZ	5330-00-527-8116	MS29512-252	96906	O-Ring
G.4	4	PBFZZ	5306-00-225-9093	MS90725-38	96906	Screw, Cap, Hexagon Head
G.4	5	PBFZZ	5310-00-407-9566	MS35338-45	96906	Washer, Lock
G.4	6	PBFZZ	5310-01-077-3906	13214E9380-5	97403	Washer, Flat
G.4	7	PBFZZ	4320-00-784-6797	13200E7204	97403	Impeller, Pump, Centrifugal
G.4	8	PBFZZ	5305-00-957-6652	MS35198-67	96906	Screw, Machine
G.4	9	PBFZZ	4320-00-790-6398	13200E7214	97403	Plate, Wear, Rotary Pump
G.4	10	PBFZZ	5310-00-133-4598	NAS1515H4	80205	Washer, Flat
G.4	11	PBFZZ	5315-00-989-2342	MS20066-183	96906	Key, Machine
G.4	12	PBFZZ	4320-00-784-6799	13200E7205	97403	Coupling, Shaft, Rigid
G.4	13	PBFZZ	4320-00-790-6357	13200E8806	97403	Seal Assembly, Pump
G.4	14	PBFZZ	5305-00-054-9261	MS51955-6	96906	Setscrew
G.4	15	PBFZZ	5310-00-851-2674	MS35691-1	96906	Nut, Plain, Hexagon
G.4	16	PBFZZ	5310-00-133-4598	NAS1515H4	80205	Washer, Flat
G.4	17	PBFZZ	5330-00-298-4139	33074	20266	Gasket
G.4	18	PBFZZ	4730-00-277-5636	WWP512	81348	Elbow, Pipe
G.4	19	PBFZZ	4730-00-277-8891	MS15953-172B	96906	Nipple, Pipe
G.4	20	PBFZZ	5340-00-991-6495	13200E7213	97403	Diverter, Pump
G.4	21	ABOZZ		47CL5	20266	Adapter
G.4	22	PAOZZ	5310-00-880-7746	MS51968-5	96906	Nut, Plain, Hexagon
G.4	23	PAOZZ	4320-00-103-8199	13200E7224	97403	Flange, Pipe
G.4	24	PAOZZ	4730-00-247-6414	13200E7225	97403	Adapter Straight, Flange to Pipe
G.4	25	PAOZZ	5305-00-637-1119	MS35214-69	96906	Screw, Machine
G.4	26	PAOZZ		13200E7228	97403	Weight, Check Valve
G.4	27	PAOZZ		13200E7227	97403	Weight, Check Valve
G.4	28	PAOZZ	5330-00-980-0123	13200E7226	97403	Gasket, Check Valve
G.4	29	PAOZZ	4820-00-174-0329	MS35782-3	96906	Cock, Drain
G.4	30	PAOZZ	5307-01-078-2425	NAS183-5-13A	80205	Stud, Plain
G.4	31	PAOZZ	4730-00-555-1355	MS20913-6CR	96906	Plug, Pipe
G.4	32	8HZZ	5310-00-717-1380	13200E7202	97403	Housing, Liquid Pump



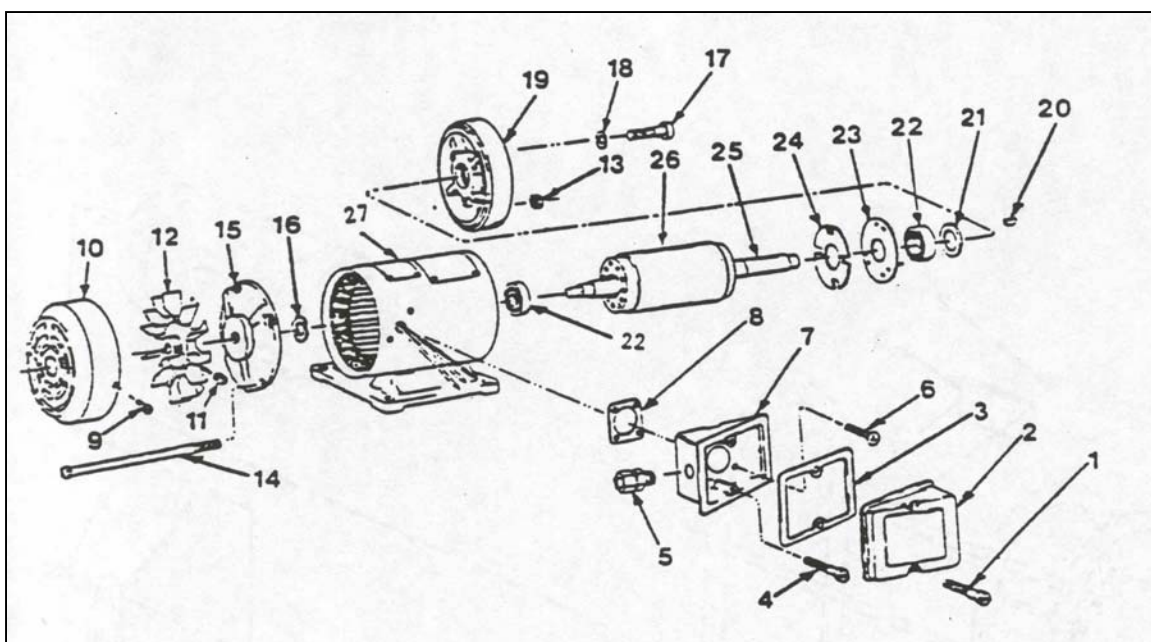


Figure G.3. Electric Motor

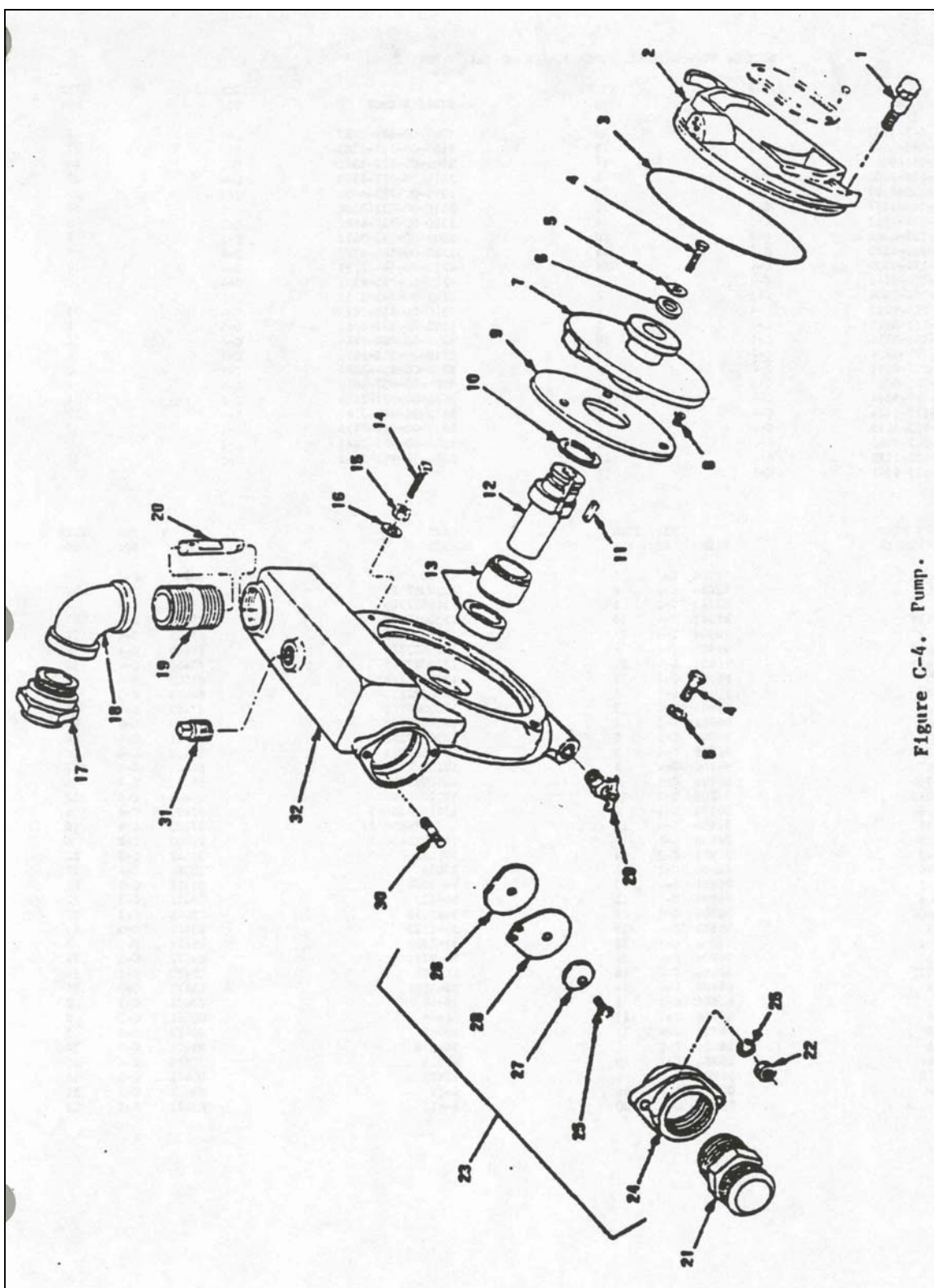


Figure C-4. Pump.

Figure G-4. Pump

Water Distribution and Wastewater Management System (WDWWMS)

NATIONAL STOCK NUMBER AND PART NUMBER INDEX

NSN	Part Number	FSCM	Nomenclature	Figure No.	Item No.
5315-00-043-1787	MS35756-34	96906	Key, Woodruff	G.3	20
5310-00-045-3296	MS35338-43	96906	Washer, Lock	G.3	18
5305-00-054-9261	MS51955-6	96906	Setscrew	G.4	14
5305-00-068-0502	MS90725-64	96906	Screw, Cap, Hexagon Head	G.1	1
4320-00-103-8199	13200E7224	97403	Flange, Pipe	G.4	23
3110-00-109-1157	1169377	19204	Bearing, Ball, Annular	G.3	22
5940-00-114-1317	MS20659-109	96906	Terminal, Lug	G.1	6
5310-00-133-4598	NAS1515H4	80205	Washer, Flat	G.4	10
5310-00-133-4598	NAS1515H4	80205	Washer, Flat	G.4	16
5940-00-143-4794	MS25036-112	96906	Terminal, Lug	G.1	9
4820-00-174-0329	MS35782-3	96906	Cock, Drain	G.4	29
5305-00-206-2508	MS35215-53	96906	Screw, Machine	G.3	4
5306-00-225-9093	MS90725-38	96906	Screw, Cap, Hexagon Head	G.4	4
4730-00-247-6414	13200E7225	97403	Adapter Straight, Flange to Pipe	G.4	24
5305-00-253-5625	MS21318-46	96906	Screw, Drive	G.2	2
4730-00-277-5636	WWP512	81348	Elbow, Pipe	G.4	18
4730-00-277-8891	MS15953-172B	96906	Nipple, Pipe	G.4	19
5975-00-281-0049	7546075	19204	Box, Connector, Electrical	G.3	5
5330-00-298-4139	33074	20266	Gasket	G.4	17
5310-00-407-9566	MS35338-45	96906	Washer, Lock	G.4	5
5330-00-527-8116	MS29512-252	96906	O-Ring	G.4	3
4730-00-555-1355	MS20913-6CR	96906	Plug, Pipe	G.4	31
5310-00-582-5965	MS35338-44	96906	Washer, Lock	G.1	2
5305-00-637-1119	MS35214-69	96906	Screw, Machine	G.4	25
5310-00-637-9541	MS35338-46	96906	Washer, Lock	G.1	19
5306-00-686-5722	13200E7212	97403	Bolt, Shoulder	G.4	1
6105-00-717-1283	36-2118	05472	Plate, Data	G.3	27
6105-00-717-1361	36-271	05472	Motor, Electric	G.3	26
5310-00-717-1380	13200E7202	97403	Housing, Liquid Pump	G.4	32
5310-00-723-4458	MS35609-404	96906	Nut, Plain, Hexagon	G.3	13
5305-00-723-0385	02781	05748	Set Screw	G.3	9
5305-00-725-2317	MS90725-64	96906	Screw, Cap, Hexagon Head	G.1	10
5310-00-732-0558	MS51967-8	96906	Nut, Plain, Hexagon	G.1	11
5310-00-761-6882	MS51967-2	96906	Nut, Plain, Hexagon	G.1	3
4320-00-784-6797	13200E7204	97403	Impeller, Pump, Centrifugal	G.4	7
4320-00-784-6799	13200E7205	97403	Coupling, Shaft, Rigid	G.4	12
4320-00-790-6357	13200E8806	97403	Seal Assembly, Pump	G.4	13
4320-00-790-6398	13200E7214	97403	Plate, Wear, Rotary Pump	G.4	9
6105-00-793-6752	62530	92940	Motor, Alternating Current	G.3	
5310-00-851-2674	MS35691-1	96906	Nut, Plain, Hexagon	G.4	15
5305-00-855-0961	MS24629-35	96906	Screw, Tapping	G.3	1
5310-00-880-7746	MS51968-5	96906	Nut, Plain, Hexagon	G.4	22
5310-00-902-6676	MS21083N3	96906	Nut, Self Locking, Hexagon	G.1	8
5310-00-903-8282	MS20364-428	96906	Nut, Self Locking, Hexagon	G.1	5

Water Distribution and Wastewater Management System (WDWWMS)

NATIONAL STOCK NUMBER AND PART NUMBER INDEX

NSN	Part Number	FSCM	Nomenclature	Figure No.	Item No.
5305-00-957-6652	MS35198-67	96906	Screw, Machine	G.4	8
6150-00-971-2116	1300E7222	97403	Cable Assembly, Power Electrical	G.2	1
5330-00-980-0123	13200E7226	97403	Gasket	G.4	28
5315-00-989-2342	MS20066-183	96906	Key, Machine	G.4	11
5305-00-989-7435	MS35207-264	96906	Screw, Machine	G.1	7
5305-00-993-2461	MS35207-281	96906	Screw, Machine	G.1	4
5305-00-995-3441	MS35207-269	96906	Screw, Machine	G.3	17
5340-00-991-6492	13200E7203	97403	Cover, Access	G.4	2
5340-00-991-6495	13200E7213	97403	Diverter, Pump	G.4	20
5310-01-077-3906	13214E9380-5	97403	Washer, Flat	G.4	6
5307-01-078-2425	NAS183-5-13A	80205	Stud, Plain	G.4	30
	13200E7227	97403		G.4	27
	13200E7228	97403		G.4	26
	13219E2404	97403	Plate, Data	G.2	4
	205522	38442		G.4	22

Water Distribution and Wastewater Management System (WDWWMS)

PART NUMBER AND NATIONAL STOCK NUMBER INDEX

Part Number	FSCM	NSN	Nomenclature	Figure No.	Item No.
33074	20266	5330-00-298-4139	Gasket	G.4	17
62530	92940	6105-00-793-6752	Motor, Alternating Current	G.3	
205522	38442			G.4	22
1169377	19204	3110-00-109-1157	Bearing, Ball, Annular	G.3	22
7546075	19204	5975-00-281-0049	Box, Connector, Electrical	G.3	5
02781	05748	5305-00-723-0385	Set Screw	G.3	9
1300E7222	97403	6150-00-971-2116	Cable Assembly, Power Electrical	G.2	1
13200E7202	97403	5310-00-717-1380	Housing, Liquid Pump	G.4	32
13200E7203	97403	5340-00-991-6492	Cover, Access	G.4	2
13200E7204	97403	4320-00-784-6797	Impeller, Pump, Centrifugal	G.4	7
13200E7205	97403	4320-00-784-6799	Coupling, Shaft, Rigid	G.4	12
13200E7212	97403	5306-00-686-5722	Bolt, Shoulder	G.4	1
13200E7213	97403	5340-00-991-6495	Diverter, Pump	G.4	20
13200E7214	97403	4320-00-790-6398	Plate, Wear, Rotary Pump	G.4	9
13200E7224	97403	4320-00-103-8199	Flange, Pipe	G.4	23
13200E7225	97403	4730-00-247-6414	Adapter Straight, Flange to Pipe	G.4	24
13200E7226	97403	5330-00-980-0123	Gasket	G.4	28
13200E7227	97403			G.4	27
13200E7228	97403			G.4	26
13200E8806	97403	4320-00-790-6357	Seal Assembly, Pump	G.4	13
13214E9380-5	97403	5310-01-077-3906	Washer, Flat	G.4	6
13219E2404	97403		Plate, Data	G.2	4
36-2118	05472	6105-00-717-1283	Plate, Data	G.3	27
36-271	05472	6105-00-717-1361	Motor, Electric	G.3	26
MS15953-172B	96906	4730-00-277-8891	Nipple, Pipe	G.4	19
MS20066-183	96906	5315-00-989-2342	Key, Machine	G.4	11
MS20364-428	96906	5310-00-903-8282	Nut, Self Locking, Hexagon	G.1	5
MS20659-109	96906	5940-00-114-1317	Terminal, Lug	G.1	6
MS20913-6CR	96906	4730-00-555-1355	Plug, Pipe	G.4	31
MS21083N3	96906	5310-00-902-6676	Nut, Self Locking, Hexagon	G.1	8
MS21318-46	96906	5305-00-253-5625	Screw, Drive	G.2	2
MS24629-35	96906	5305-00-855-0961	Screw, Tapping	G.3	1
MS25036-112	96906	5940-00-143-4794	Terminal, Lug	G.1	9
MS29512-252	96906	5330-00-527-8116	O-Ring	G.4	3
MS35198-67	96906	5305-00-957-6652	Screw, Machine	G.4	8
MS35207-264	96906	5305-00-989-7435	Screw, Machine	G.1	7
MS35207-269	96906	5305-00-995-3441	Screw, Machine	G.3	17
MS35207-281	96906	5305-00-993-2461	Screw, Machine	G.1	4
MS35214-69	96906	5305-00-637-1119	Screw, Machine	G.4	25
MS35215-53	96906	5305-00-206-2508	Screw, Machine	G.3	4
MS35338-43	96906	5310-00-045-3296	Washer, Lock	G.3	18
MS35338-44	96906	5310-00-582-5965	Washer, Lock	G.1	2
MS35338-45	96906	5310-00-407-9566	Washer, Lock	G.4	5
MS35338-46	96906	5310-00-637-9541	Washer, Lock	G.1	19
MS35609-404	96906	5310-00-723-4458	Nut, Plain, Hexagon	G.3	13

Water Distribution and Wastewater Management System (WDWWMS)

PART NUMBER AND NATIONAL STOCK NUMBER INDEX

Part Number	FSCM	NSN	Nomenclature	Figure No.	Item No.
MS35691-1	96906	5310-00-851-2674	Nut, Plain, Hexagon	G.4	15
MS35756-34	96906	5315-00-043-1787	Key, Woodruff	G.3	20
MS35782-3	96906	4820-00-174-0329	Cock, Drain	G.4	29
MS51955-6	96906	5305-00-054-9261	Setscrew	G.4	14
MS51967-2	96906	5310-00-761-6882	Nut, Plain, Hexagon	G.1	3
MS51967-8	96906	5310-00-732-0558	Nut, Plain, Hexagon	G.1	11
MS51968-5	96906	5310-00-880-7746	Nut, Plain, Hexagon	G.4	22
MS90725-38	96906	5306-00-225-9093	Screw, Cap, Hexagon Head	G.4	4
MS90725-64	96906	5305-00-068-0502	Screw, Cap, Hexagon Head	G.1	1
MS90725-64	96906	5305-00-725-2317	Screw, Cap, Hexagon Head	G.1	10
NAS1515H4	80205	5310-00-133-4598	Washer, Flat	G.4	10
NAS1515H4	80205	5310-00-133-4598	Washer, Flat	G.4	16
NAS183-5-13A	80205	5307-01-078-2425	Stud, Plain	G.4	30
WWP512	81348	4730-00-277-5636	Elbow, Pipe	G.4	18

APPENDIX G
ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT
MAINTENANCE, REPAIR PARTS AND SPECIAL TOOLS LIST

PUMP UNIT, CENTRIFUGAL, 65 GPM

INTRODUCTION

G-1. Scope.

This section lists the repair parts and special tools for operation and performance of organizational, direct support, and general support maintenance of the E. C. Schleyer Pump Co. Model 4M-SE2000 electric motor driven pump.

G-2. General

This Repair Parts and Special Tools List is divided into the following sections:

- a. *Section II, Repair Parts List.* A list of repair parts authorized for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending numerical sequence, with the parts in each group listed in figure and item number sequence. Bulk materials are listed in NSN sequence.
- b. *Section III, Special Tools List.* (Not Applicable).
- c. *Section IV, National Stock Number and Part Number Index.* A list, in ascending numerical sequence, of all National Stock Numbers (NSN) appearing in the listings, followed by a list, in alphanumeric sequence, of all part numbers appearing in the listings. NSNs and part numbers (PN) are cross-referenced to each illustration figure and item number appearance. This index is followed by a cross-reference list of reference designations to figure and item number when applicable.

G-3. Explanation of Columns.

The following provides an explanation of columns in the tabular listings:

- a. *Illustration.* This column is divided as follows:
 - (1) *Figure Number.* Indicates the figure number of the illustration in which the item is shown.
 - (2) *Item Number.* The number used to identify each item called out in the illustration.

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b. *Source, Maintainability and Recovery Codes (SMR).*

(1) *Source Code.* Source codes are assigned to support items to indicate the manner of acquiring support items for maintenance, repair, or overhaul of end items. Source codes are entered in the first and second positions of the Uniform SMR Code format as follows:

<i>Code</i>	<i>Definition</i>
PA	Item procured and stocked for anticipated or known usage.
PB	Item procured and stocked for insurance purpose because essentiality dictates that a minimum quantity be available in the supply systems.
PC	Item procured and stocked and which otherwise would be coded PA except that it is deteriorative in nature.
PD	Support item, excluding support equipment, procured for initial issue or outfitting and stocked only for subsequent or additional issues or outfittings. Not subject to automatic replenishment.
PE	Support equipment procured and stocked for initial issue or outfitting to specific maintenance repair activities.
PF	Support equipment which will not be stocked but which will be centrally procured on demand.
PG	Item procured and stocked to provide for sustained support for the life of the equipment. It is applied to an item peculiar to the equipment which, because of probable discontinuance or shutdown of production facilities, would prove uneconomical to reproduce at a later time.
KD	An item of a depot overhaul/repair kit and not purchased separately. Depot kit defined as a kit that provides items required at the time of overhaul or repair.
KF	An item of a maintenance kit and not purchased separately. Maintenance kit defined as a kit that provided an item that can be replaced at organizational or intermediate levels of maintenance.
KB	Item included in both a depot overhaul/repair kit and a maintenance kit.
MO	Item to be manufactured or fabricated at organizational level.
MF	Item to be manufactured or fabricated at direct support level.
MH	Item to be manufactured or fabricated at general support level.

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MD Item to be manufactured or fabricated at depot maintenance level.

Code Definition

AO Item to be assembled at organizational level.

AF Item to be assembled at direct support maintenance level.

AH Item to be assembled at general support maintenance level.

AD Item to be assembled at depot maintenance level.

XA Item is not procured or stocked because the requirements for the item will result in the replacement of the next higher assembly.

XB Item is not procured or stocked. If not available through salvage, requisition.

XD A support item that is not stocked. When required item will be procured through normal supply channels.

NOTE

Cannibalization or salvage may be used as a source of supply for any items coded above except for those coded XA, XD, and aircraft support items as restricted by AR 700-42.

(2) Maintenance Code.

Maintenance codes are assigned to indicate the levels of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the Uniform SMR Code format as follows:

(a) The maintenance code

entered in the third position will indicate the lowest maintenance level authorized to remove, replace, and use the support item. The maintenance code entered in the third position will indicate one of the following levels of maintenance:

Code Application/Explanation

C Crew or operator maintenance performed within organizational maintenance.

O Support item is removed, replaced, used at the organizational level.

I Support item is removed, replaced, used by the direct support element of integrated direct support maintenance.

F Support item s removed, replaced, used at the direct support level.

Water Distribution and Wastewater Management System (WDWWMS)

<i>Code</i>	<i>Application/Explanation</i>
-------------	--------------------------------

H	Support item s removed, replaced, used at the general support level.
---	--

D	Support item s removed, replaced, used at the depot, mobile depot, specialized repair activity only.
---	--

NOTE

Codes "I" and "F" will be considered the same by direct support units.

(b) The maintenance code entered in the fourth position indicates whether the item is to be repaired and identified the lowest maintenance level with the capability to perform repair (i.e., all authorized maintenance functions). This position will contain one of the following maintenance codes:

<i>Code</i>	<i>Application/Explanation</i>
-------------	--------------------------------

O	The lowest maintenance level capable of complete repair of support item is the organizational level.
---	--

F	The lowest maintenance level capable of complete repair of support item is the direct support level.
---	--

H	The lowest maintenance level capable of complete repair of support item is the general support level.
---	---

D	The lowest maintenance level capable of complete repair of support item is the depot level, mobile depot or specialized repair activity.
---	--

Z	Non-repairable. No repair is authorized.
---	--

B	No repair is authorized. The item may be reconditioned by adjusting, lubricating, etc., at the user level. No parts or special tools are procured for maintenance of this item.
---	---

(3) Recoverability Code.

Recoverability codes are assigned to support items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the Uniform SMR Code format as follows:

Recoverability

Codes

Definition

Z	Non-Repairable item. When unserviceable, condemn and dispose at the level indicated in position 3.
O	Repairable item. When uneconomically repairable, condemn and dispose at organizational level.
F	Repairable item. When uneconomically repairable, condemn and dispose at the direct support level.
H	Repairable item. When uneconomically repairable, condemn and dispose at the general support level.
D	Repairable item. When beyond lower level repair capability, return to depot. Condemnation and disposal not authorized below depot level.
L	Repairable item. When beyond lower level repair capability, return to depot. Condemnation and disposal not authorized below depot/special repair activity level.
A	Item requires special handling or condemnation procedures because of specific reasons (i.e., precious metal content, high dollar value, critical material or hazardous material). Refer to appropriate manuals/directives for specific instructions.

c. National Stock Number.

Indicates the National Stock Number assigned to the item and will be used for requisitioning purposes.

d. Part Number. Indicates the primary part number used by the manufacturer which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements, to identify an item or range of items.

NOTE

When a stock numbered item is requisitioned, the repair part received may have a different part number than the part being replaced.

e. *Federal Supply Code for Manufacturer (FSCM)*. The FSCM is a 5-digit numeric code listed in SB 708-42 which is used to identify the manufacturer, distributor, or Government agency, etc.

f. *Description*. Indicates the Federal item name and, if required, a minimum description to identify the item.

g. *Unit of Measure (U/M)*. Indicates the standard of the basic quantity of the listed item as used in performing the actual maintenance function. This measurement is expressed by a two-character alphabetical abbreviation (e.g., ea. in. pr. Etc.). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

h. *Quantity Incorporated in Unit*. Indicates the quantity of the item used in the breakdown shown on the illustration figure which is prepared for a functional group, subfunctional group, or an assembly. A “V” appearing in this column in lieu of a quantity indicates that no specific quantity is applicable, (e.g., shims, spacers, etc.).

G-4. How to Locate Repair Parts.

a. When National Stock Number or Part Number is Unknown.

(1) *First*. Using the table of contents, determine the functional group within which the repair part belong. This necessary since illustrations are prepared for functional groups and listing are divided into the same groups.

(2) *Second*. Find the illustration covering the functional group to which the repair part belongs.

(3) *Third*. Identify the repair part on the illustration figure and item number of the repair part.

(4) *Fourth*. Using the Repair Parts Listing, find the figure and item number noted on the illustration.

b. When National Stock Number or Part Number is Known.

(1) *First*. Using the Index of National Stock Numbers and Part Numbers, find the pertinent National Stock Number or part number. This index is in ascending NSN sequence followed by a list of part numbers in ascending alphanumeric sequence, cross-references to the illustration figure number and item number.

(2) *Second.* After finding the figure and item number, locate the figure and item number in the repair parts list.

G-5. Abbreviations.

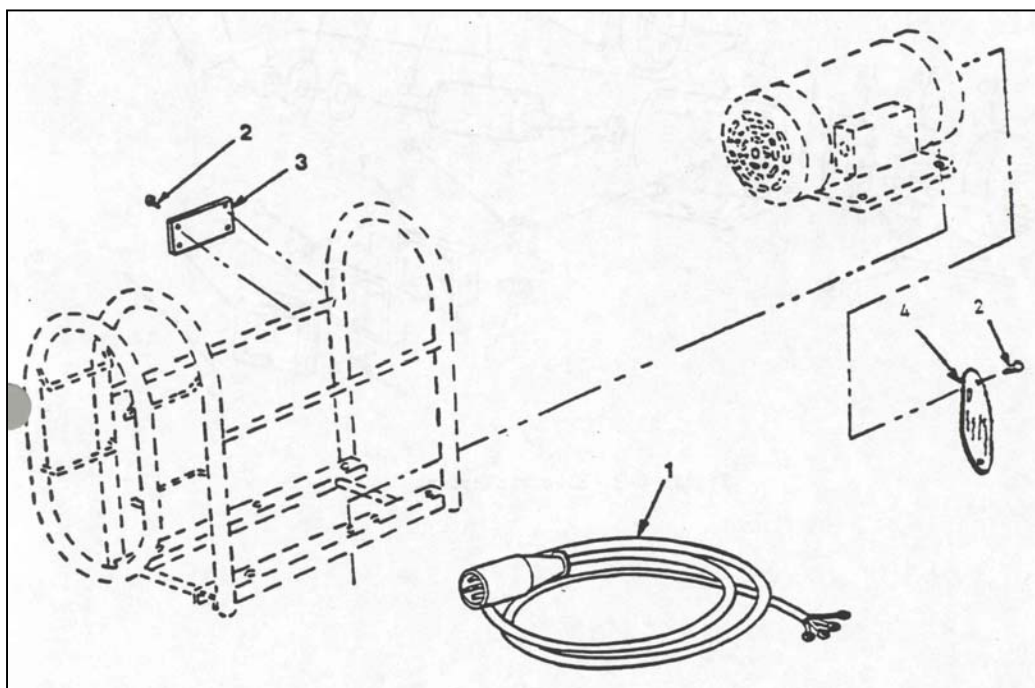
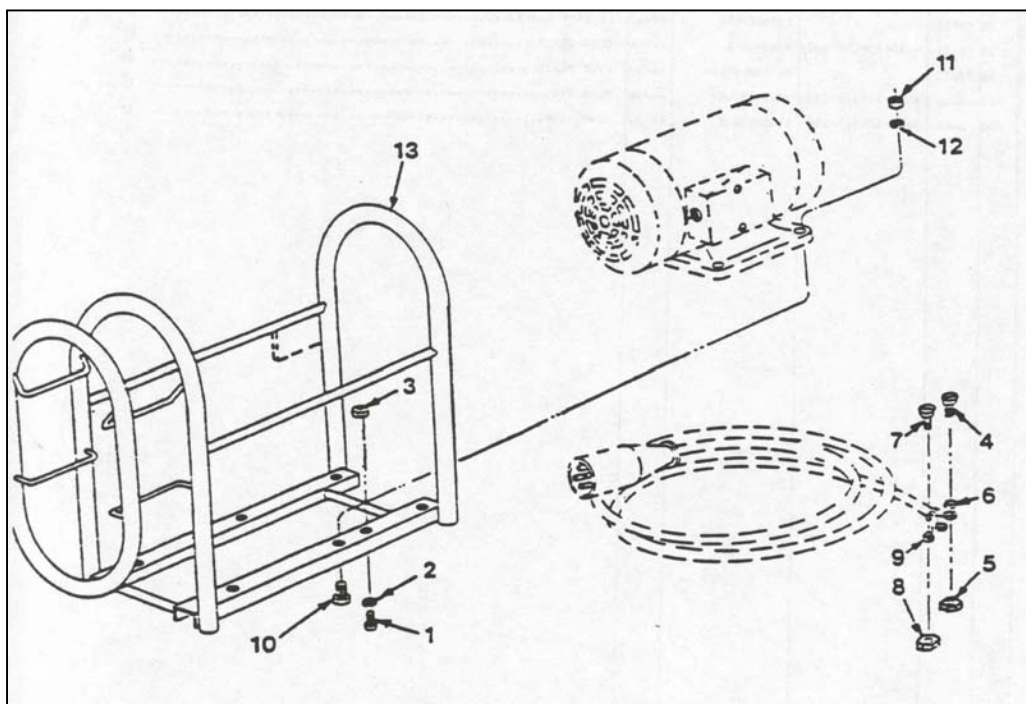
<i>Abbreviations</i>	<i>Explanation</i>
mtg	mounting

Water Distribution and Wastewater Management System (WDWWMS)

(1)		(2)	(3)	(4)	(5)	(6)
Illustration						
(a)	(b)					
Figure	Item	SMR				
No.	No.	Code	NSN	Part Number	FSCM	Nomenclature
SECTION 01 REPAIR PARTS LIST						
Group 31 - FRAME ASSEMBLY						
G.1	1	PAOZZ	5305-00-068-0502	MS90725-64	96906	Screw, Cap, Hexagon Head
G.1	2	PAOZZ	5310-00-582-5965	MS35338-44	96906	Washer, Lock
G.1	3	PAOZZ	5310-00-761-6882	MS51967-2	96906	Nut, Plain, Hexagon
G.1	4	PAOZZ	5305-00-993-2461	MS35207-281	96906	Screw, Machine
G.1	5	PAOZZ	5310-00-903-8282	MS20364-428	96906	Nut, Self Locking, Hexagon
G.1	6	PAOZZ	5940-00-114-1317	MS20659-109	96906	Terminal, Lug
G.1	7	PAOZZ	5305-00-989-7435	MS35207-264	96906	Screw, Machine
G.1	8	PAOZZ	5310-00-902-6676	MS21083N3	96906	Nut, Self Locking, Hexagon
G.1	9	PAOZZ	5940-00-143-4794	MS25036-112	96906	Terminal, Lug
G.1	10	PAOZZ	5305-00-725-2317	MS90725-64	96906	Screw, Cap, Hexagon Head
G.1	11	PAOZZ	5310-00-732-0558	MS51967-8	96906	Nut, Plain, Hexagon
G.1	12	PAOZZ	5310-00-637-9541	MS35338-46	96906	Washer, Lock
G.1	13	PBOFE		13200E7218	97403	FR PUMP WELDMENT
GROUP 02 ASSESSORY ITEMS						
G.2	1	PAOZZ	6150-00-971-2116	1300E7222	97403	Cable Assembly, Power Electrical
G.2	2	PAOZZ	5305-00-253-5625	MS21318-46	96906	Screw, Drive
G.2	3	PAOZZ		6673407	78099	Plate, Data
G.2	4	PAOZZ		13219E2404	97403	Plate, Data
GROUP 03 ELECTRIC MOTOR ASSEMBLY						
G.3		PAOZZ	6150-00-971-2116	13200E7222	97403	Cable Assembly, Power Electric
G.3	1	PAOZZ	5305-00-855-0961	MS24629-35	96906	Screw, Tapping
G.3	2	PAOZZ		06-40	05472	Lid Box
G.3	3	PAOZZ		06-49	05472	Gasket Box Lid
G.3	4	PAOZZ	5305-00-206-2508	MS35215-53	96906	Screw, Machine
G.3	5	PAOZZ	5975-00-281-0049	7546075	19204	Box, Connector, Electrical
G.3	6	PAOZZ		A678760		Screw, Box
G.3	7	PAOZZ		36-2131		Box Connector
G.3	8	PAOZZ	5320-01-065-8851	36-48	05472	Gasket, Box
G.3	9	PAOZZ	5305-00-723-0385	02781	05748	Set Screw
G.3	10	PAOZZ		36-696	05472	Cover, Fan
G.3	11	PAOZZ	5305-00-723-9385	MS51963-65	96909	Set Screw
G.3	12	PAOZZ	4140-01-087-0359	32-134	05472	Fan, External
G.3	13	PAOZZ	5310-00-723-4458	MS35609-404	96906	Nut, Plain, Hexagon
G.3	14	PAOZZ		36-696	05472	Cover, Fan
G.3	15	PAPZZ		36-1120	05472	Endplate Pulley
G.3	16	PAPZZ		52WES	05472	Washer Retainer, Special
G.3	17	PAOZZ	5305-00-995-3441	MS35207-269	96906	Screw, Machine
G.3	18	PAOZZ	5310-00-045-3296	MS35338-43	96906	Washer, Lock
G.3	19	XBPZZ		36-694	05472	Endplate, Front

Water Distribution and Wastewater Management System (WDWWMS)

(1)		(2)	(3)	(4)	(5)	(6)
Illustration						
(a)	(b)					
Figure	Item	SMR				
No.	No.	Code	NSN	Part Number	FSCM	Nomenclature
						GROUP 03 ELECTRIC MOTOR ASSEMBLY
						(CONTINUED)
G.3	20	PAOZZ	5315-00-043-1787	MS35756-34	96906	Key, Woodruff
G.3	21	PAOZZ		6-31	05472	Sleeve, Shaft
G.3	22	PAOZZ	3110-00-109-1157	1169377	19204	Bearing, Ball, Annular
G.3	23	ABFZZ		6-417	05472	Retainer
G.3	24	ABFZZ		38-1008	05472	Fan, Internal
G.3	25	ABFZZ		36-3998	05472	Shaft
G.3	26	ABFZZ	6105-00-717-1361	36-271	05472	Motor, Electric
G.3	27	ABFZZ	6105-00-717-1283	36-2118	05472	Plate, Data
G.3		PAOZZ	6105-00-793-6752	62530	92940	Motor, Alternating Current
						GROUP 34 PUMP ASSEMBLY
G.4	1	PBFZZ	5306-00-686-5722	13200E7212	97403	Bolt, Shoulder
G.4	2	ABFZZ	5340-00-991-6492	13200E7203	97403	Cover, Access
G.4	3	PBFZZ	5330-00-527-8116	MS29512-252	96906	O-Ring
G.4	4	PBFZZ	5306-00-225-9093	MS90725-38	96906	Screw, Cap, Hexagon Head
G.4	5	PBFZZ	5310-00-407-9566	MS35338-45	96906	Washer, Lock
G.4	6	PBFZZ	5310-01-077-3906	13214E9380-5	97403	Washer, Flat
G.4	7	PBFZZ	4320-00-784-6797	13200E7204	97403	Impeller, Pump, Centrifugal
G.4	8	PBFZZ	5305-00-957-6652	MS35198-67	96906	Screw, Machine
G.4	9	PBFZZ	4320-00-790-6398	13200E7214	97403	Plate, Wear, Rotary Pump
G.4	10	PBFZZ	5310-00-133-4598	NAS1515H4	80205	Washer, Flat
G.4	11	PBFZZ	5315-00-989-2342	MS20066-183	96906	Key, Machine
G.4	12	PBFZZ	4320-00-784-6799	13200E7205	97403	Coupling, Shaft, Rigid
G.4	13	PBFZZ	4320-00-790-6357	13200E8806	97403	Seal Assembly, Pump
G.4	14	PBFZZ	5305-00-054-9261	MS51955-6	96906	Setscrew
G.4	15	PBFZZ	5310-00-851-2674	MS35691-1	96906	Nut, Plain, Hexagon
G.4	16	PBFZZ	5310-00-133-4598	NAS1515H4	80205	Washer, Flat
G.4	17	PBFZZ	5330-00-298-4139	33074	20266	Gasket
G.4	18	PBFZZ	4730-00-277-5636	WWP512	81348	Elbow, Pipe
G.4	19	PBFZZ	4730-00-277-8891	MS15953-172B	96906	Nipple, Pipe
G.4	20	PBFZZ	5340-00-991-6495	13200E7213	97403	Diverter, Pump
G.4	21	ABOZZ		47CL5	20266	Adapter
G.4	22	PAOZZ	5310-00-880-7746	MS51968-5	96906	Nut, Plain, Hexagon
G.4	23	PAOZZ	4320-00-103-8199	13200E7224	97403	Flange, Pipe
G.4	24	PAOZZ	4730-00-247-6414	13200E7225	97403	Adapter Straight, Flange to Pipe
G.4	25	PAOZZ	5305-00-637-1119	MS35214-69	96906	Screw, Machine
G.4	26	PAOZZ		13200E7228	97403	Weight, Check Valve
G.4	27	PAOZZ		13200E7227	97403	Weight, Check Valve
G.4	28	PAOZZ	5330-00-980-0123	13200E7226	97403	Gasket, Check Valve
G.4	29	PAOZZ	4820-00-174-0329	MS35782-3	96906	Cock, Drain
G.4	30	PAOZZ	5307-01-078-2425	NAS183-5-13A	80205	Stud, Plain
G.4	31	PAOZZ	4730-00-555-1355	MS20913-6CR	96906	Plug, Pipe
G.4	32	8HZZ	5310-00-717-1380	13200E7202	97403	Housing, Liquid Pump



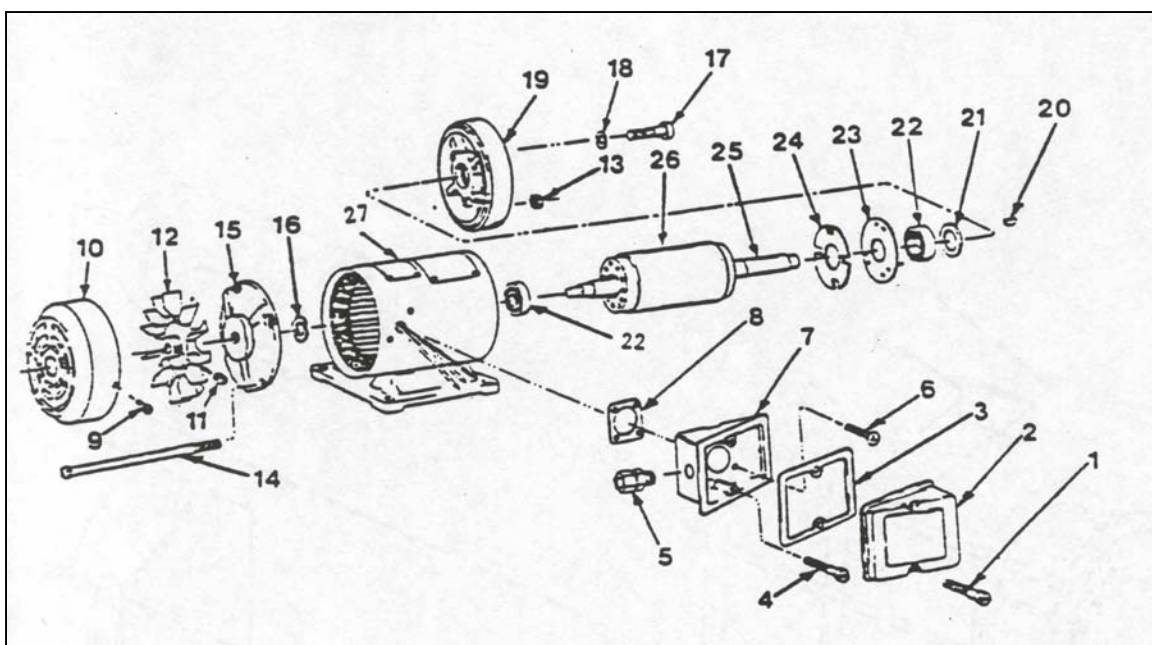


Figure G.3. Electric Motor

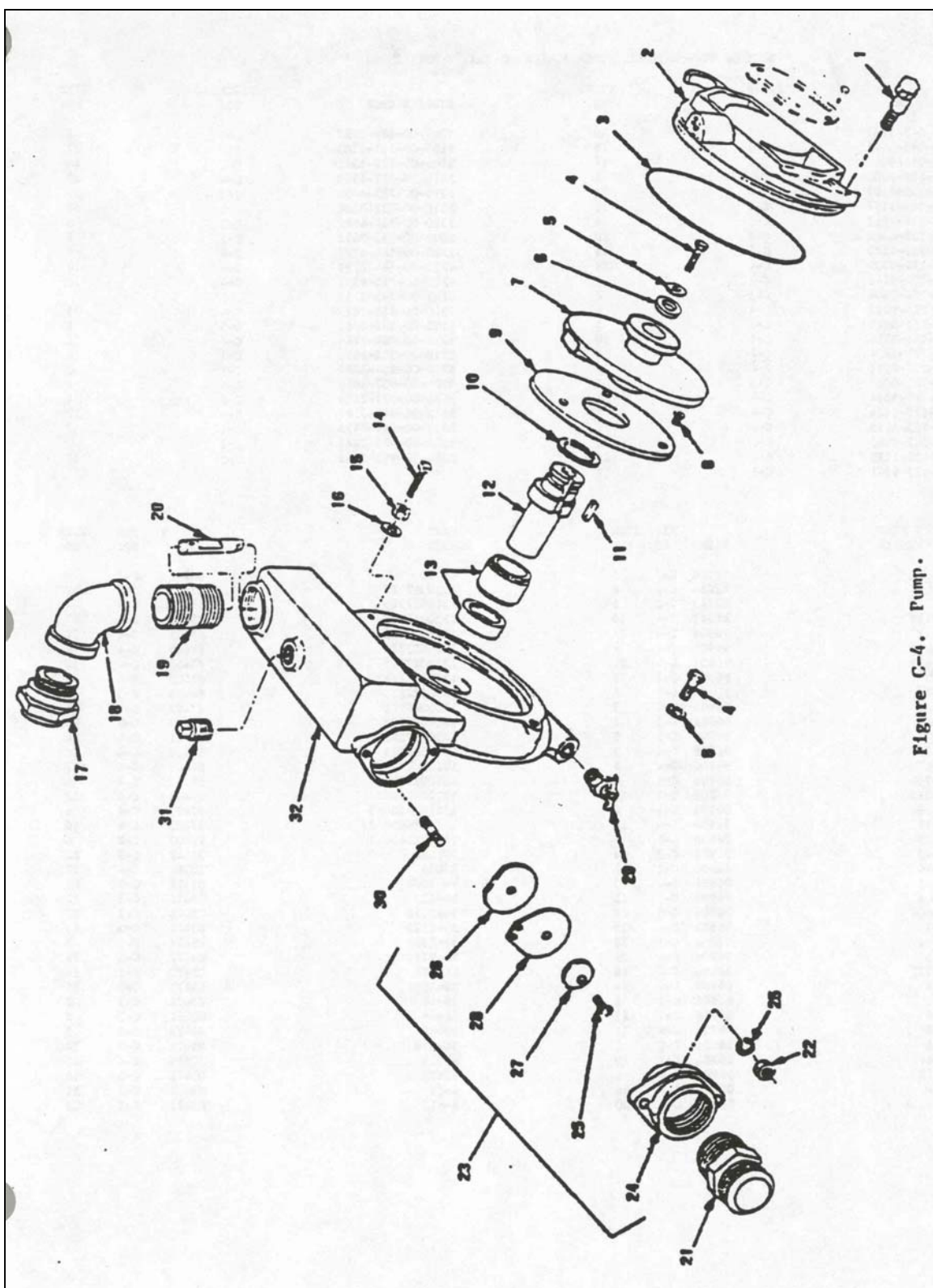


Figure C-4. Pump.

Figure G-4. Pump

Water Distribution and Wastewater Management System (WDWWMS)

NATIONAL STOCK NUMBER AND PART NUMBER INDEX

NSN	Part Number	FSCM	Nomenclature	Figure No.	Item No.
5315-00-043-1787	MS35756-34	96906	Key, Woodruff	G.3	20
5310-00-045-3296	MS35338-43	96906	Washer, Lock	G.3	18
5305-00-054-9261	MS51955-6	96906	Setscrew	G.4	14
5305-00-068-0502	MS90725-64	96906	Screw, Cap, Hexagon Head	G.1	1
4320-00-103-8199	13200E7224	97403	Flange, Pipe	G.4	23
3110-00-109-1157	1169377	19204	Bearing, Ball, Annular	G.3	22
5940-00-114-1317	MS20659-109	96906	Terminal, Lug	G.1	6
5310-00-133-4598	NAS1515H4	80205	Washer, Flat	G.4	10
5310-00-133-4598	NAS1515H4	80205	Washer, Flat	G.4	16
5940-00-143-4794	MS25036-112	96906	Terminal, Lug	G.1	9
4820-00-174-0329	MS35782-3	96906	Cock, Drain	G.4	29
5305-00-206-2508	MS35215-53	96906	Screw, Machine	G.3	4
5306-00-225-9093	MS90725-38	96906	Screw, Cap, Hexagon Head	G.4	4
4730-00-247-6414	13200E7225	97403	Adapter Straight, Flange to Pipe	G.4	24
5305-00-253-5625	MS21318-46	96906	Screw, Drive	G.2	2
4730-00-277-5636	WWP512	81348	Elbow, Pipe	G.4	18
4730-00-277-8891	MS15953-172B	96906	Nipple, Pipe	G.4	19
5975-00-281-0049	7546075	19204	Box, Connector, Electrical	G.3	5
5330-00-298-4139	33074	20266	Gasket	G.4	17
5310-00-407-9566	MS35338-45	96906	Washer, Lock	G.4	5
5330-00-527-8116	MS29512-252	96906	O-Ring	G.4	3
4730-00-555-1355	MS20913-6CR	96906	Plug, Pipe	G.4	31
5310-00-582-5965	MS35338-44	96906	Washer, Lock	G.1	2
5305-00-637-1119	MS35214-69	96906	Screw, Machine	G.4	25
5310-00-637-9541	MS35338-46	96906	Washer, Lock	G.1	19
5306-00-686-5722	13200E7212	97403	Bolt, Shoulder	G.4	1
6105-00-717-1283	36-2118	05472	Plate, Data	G.3	27
6105-00-717-1361	36-271	05472	Motor, Electric	G.3	26
5310-00-717-1380	13200E7202	97403	Housing, Liquid Pump	G.4	32
5310-00-723-4458	MS35609-404	96906	Nut, Plain, Hexagon	G.3	13
5305-00-723-0385	02781	05748	Set Screw	G.3	9
5305-00-725-2317	MS90725-64	96906	Screw, Cap, Hexagon Head	G.1	10
5310-00-732-0558	MS51967-8	96906	Nut, Plain, Hexagon	G.1	11
5310-00-761-6882	MS51967-2	96906	Nut, Plain, Hexagon	G.1	3
4320-00-784-6797	13200E7204	97403	Impeller, Pump, Centrifugal	G.4	7
4320-00-784-6799	13200E7205	97403	Coupling, Shaft, Rigid	G.4	12
4320-00-790-6357	13200E8806	97403	Seal Assembly, Pump	G.4	13
4320-00-790-6398	13200E7214	97403	Plate, Wear, Rotary Pump	G.4	9
6105-00-793-6752	62530	92940	Motor, Alternating Current	G.3	
5310-00-851-2674	MS35691-1	96906	Nut, Plain, Hexagon	G.4	15
5305-00-855-0961	MS24629-35	96906	Screw, Tapping	G.3	1
5310-00-880-7746	MS51968-5	96906	Nut, Plain, Hexagon	G.4	22
5310-00-902-6676	MS21083N3	96906	Nut, Self Locking, Hexagon	G.1	8
5310-00-903-8282	MS20364-428	96906	Nut, Self Locking, Hexagon	G.1	5

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NSN	Part Number	FSCM	Nomenclature	Figure No.	Item No.
5305-00-957-6652	MS35198-67	96906	Screw, Machine	G.4	8
6150-00-971-2116	1300E7222	97403	Cable Assembly, Power Electrical	G.2	1
5330-00-980-0123	13200E7226	97403	Gasket	G.4	28
5315-00-989-2342	MS20066-183	96906	Key, Machine	G.4	11
5305-00-989-7435	MS35207-264	96906	Screw, Machine	G.1	7
5305-00-993-2461	MS35207-281	96906	Screw, Machine	G.1	4
5305-00-995-3441	MS35207-269	96906	Screw, Machine	G.3	17
5340-00-991-6492	13200E7203	97403	Cover, Access	G.4	2
5340-00-991-6495	13200E7213	97403	Diverter, Pump	G.4	20
5310-01-077-3906	13214E9380-5	97403	Washer, Flat	G.4	6
5307-01-078-2425	NAS183-5-13A	80205	Stud, Plain	G.4	30
	13200E7227	97403		G.4	27
	13200E7228	97403		G.4	26
	13219E2404	97403	Plate, Data	G.2	4
	205522	38442		G.4	22

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Part Number	FSCM	NSN	Nomenclature	Figure No.	Item No.
33074	20266	5330-00-298-4139	Gasket	G.4	17
62530	92940	6105-00-793-6752	Motor, Alternating Current	G.3	
205522	38442			G.4	22
1169377	19204	3110-00-109-1157	Bearing, Ball, Annular	G.3	22
7546075	19204	5975-00-281-0049	Box, Connector, Electrical	G.3	5
02781	05748	5305-00-723-0385	Set Screw	G.3	9
1300E7222	97403	6150-00-971-2116	Cable Assembly, Power Electrical	G.2	1
13200E7202	97403	5310-00-717-1380	Housing, Liquid Pump	G.4	32
13200E7203	97403	5340-00-991-6492	Cover, Access	G.4	2
13200E7204	97403	4320-00-784-6797	Impeller, Pump, Centrifugal	G.4	7
13200E7205	97403	4320-00-784-6799	Coupling, Shaft, Rigid	G.4	12
13200E7212	97403	5306-00-686-5722	Bolt, Shoulder	G.4	1
13200E7213	97403	5340-00-991-6495	Diverter, Pump	G.4	20
13200E7214	97403	4320-00-790-6398	Plate, Wear, Rotary Pump	G.4	9
13200E7224	97403	4320-00-103-8199	Flange, Pipe	G.4	23
13200E7225	97403	4730-00-247-6414	Adapter Straight, Flange to Pipe	G.4	24
13200E7226	97403	5330-00-980-0123	Gasket	G.4	28
13200E7227	97403			G.4	27
13200E7228	97403			G.4	26
13200E8806	97403	4320-00-790-6357	Seal Assembly, Pump	G.4	13
13214E9380-5	97403	5310-01-077-3906	Washer, Flat	G.4	6
13219E2404	97403		Plate, Data	G.2	4
36-2118	05472	6105-00-717-1283	Plate, Data	G.3	27
36-271	05472	6105-00-717-1361	Motor, Electric	G.3	26
MS15953-172B	96906	4730-00-277-8891	Nipple, Pipe	G.4	19
MS20066-183	96906	5315-00-989-2342	Key, Machine	G.4	11
MS20364-428	96906	5310-00-903-8282	Nut, Self Locking, Hexagon	G.1	5
MS20659-109	96906	5940-00-114-1317	Terminal, Lug	G.1	6
MS20913-6CR	96906	4730-00-555-1355	Plug, Pipe	G.4	31
MS21083N3	96906	5310-00-902-6676	Nut, Self Locking, Hexagon	G.1	8
MS21318-46	96906	5305-00-253-5625	Screw, Drive	G.2	2
MS24629-35	96906	5305-00-855-0961	Screw, Tapping	G.3	1
MS25036-112	96906	5940-00-143-4794	Terminal, Lug	G.1	9
MS29512-252	96906	5330-00-527-8116	O-Ring	G.4	3
MS35198-67	96906	5305-00-957-6652	Screw, Machine	G.4	8
MS35207-264	96906	5305-00-989-7435	Screw, Machine	G.1	7
MS35207-269	96906	5305-00-995-3441	Screw, Machine	G.3	17
MS35207-281	96906	5305-00-993-2461	Screw, Machine	G.1	4
MS35214-69	96906	5305-00-637-1119	Screw, Machine	G.4	25
MS35215-53	96906	5305-00-206-2508	Screw, Machine	G.3	4
MS35338-43	96906	5310-00-045-3296	Washer, Lock	G.3	18
MS35338-44	96906	5310-00-582-5965	Washer, Lock	G.1	2
MS35338-45	96906	5310-00-407-9566	Washer, Lock	G.4	5
MS35338-46	96906	5310-00-637-9541	Washer, Lock	G.1	19
MS35609-404	96906	5310-00-723-4458	Nut, Plain, Hexagon	G.3	13

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Part Number	FSCM	NSN	Nomenclature	Figure No.	Item No.
MS35691-1	96906	5310-00-851-2674	Nut, Plain, Hexagon	G.4	15
MS35756-34	96906	5315-00-043-1787	Key, Woodruff	G.3	20
MS35782-3	96906	4820-00-174-0329	Cock, Drain	G.4	29
MS51955-6	96906	5305-00-054-9261	Setscrew	G.4	14
MS51967-2	96906	5310-00-761-6882	Nut, Plain, Hexagon	G.1	3
MS51967-8	96906	5310-00-732-0558	Nut, Plain, Hexagon	G.1	11
MS51968-5	96906	5310-00-880-7746	Nut, Plain, Hexagon	G.4	22
MS90725-38	96906	5306-00-225-9093	Screw, Cap, Hexagon Head	G.4	4
MS90725-64	96906	5305-00-068-0502	Screw, Cap, Hexagon Head	G.1	1
MS90725-64	96906	5305-00-725-2317	Screw, Cap, Hexagon Head	G.1	10
NAS1515H4	80205	5310-00-133-4598	Washer, Flat	G.4	10
NAS1515H4	80205	5310-00-133-4598	Washer, Flat	G.4	16
NAS183-5-13A	80205	5307-01-078-2425	Stud, Plain	G.4	30
WWP512	81348	4730-00-277-5636	Elbow, Pipe	G.4	18